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OFFICIAL ORGAN

OF

THE UNITED KINGDOM.

No. 1083. (No. 39. Vol. XXI.)

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SEPTEMBER 27, 1929.

SIXPENCE WEEKLY.

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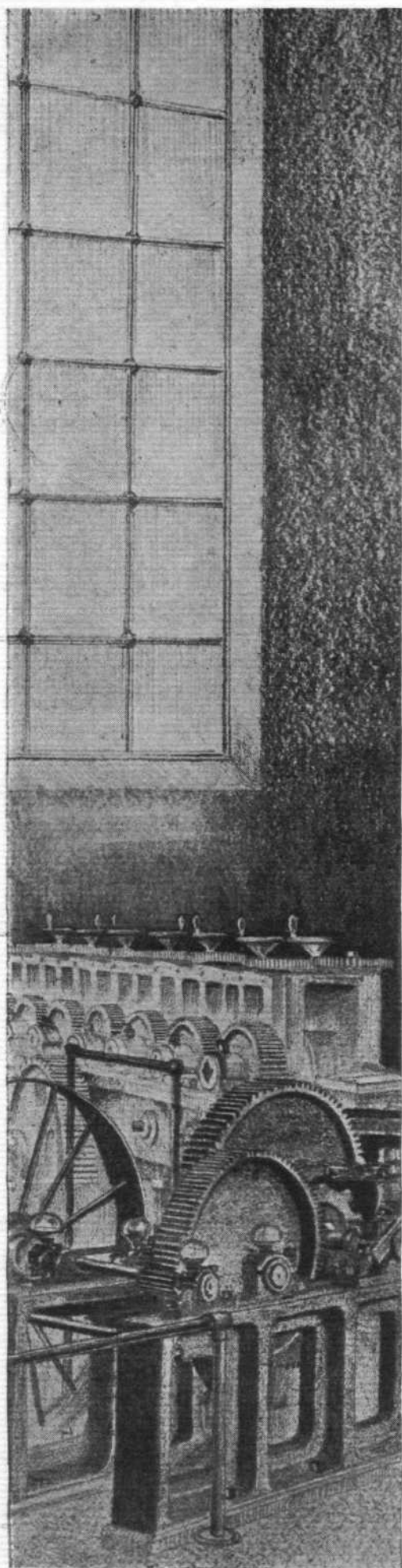
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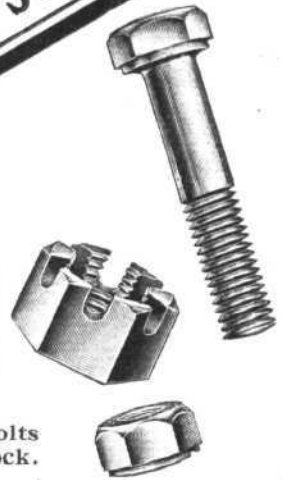
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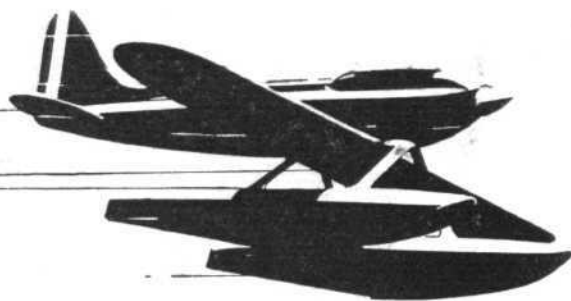
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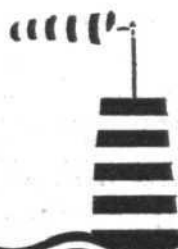
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Founder and Editor: STANLEY SPOONER

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OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

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## DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1929.	
Sept. 28	Northampton Aero Club Meeting, Sywell.
Oct. 1	Gordon-Bennett Balloon Race, St. Louis, U.S.A.
Oct. 5	Newcastle Air Pageant, Cramlington Aerodrome.
Oct. 9	Lecture, "Progress in Civil Aviation," by Air Vice-Marshal Sir Sefton Branccker, before Royal United Service Institution.
Oct. 10	Air Pageant and Light 'Plane Race, Hull Municipal Aerodrome.
Oct. 10	Lecture, "The Range of Aircraft," by Mr. C. R. Fairey, before R.Ae.S. and Inst. Ae.E.
Oct. 24	Lecture, "The Art of Flying Land and Sea Machines," by Capt. N. Macmillan, before R.Ae.S. and Inst. Ae.E.
Oct. 31	Guggenheim Safe-Aircraft Competition Closes.
Nov. 7	Lecture, "Recent Developments of Fuels and Dopes for Aircraft Engines," by Dr. A. E. Dunstan, before R.Ae.S. and Inst. Ae.E.
Nov. 21	Lecture, "The Inspection of Materials," by Mr. L. W. Johnson, before R.Ae.S. and Inst. Ae.E.

## EDITORIAL COMMENT

**D**URING the past summer the somewhat "hectic" activities in the world of heavier-than-air craft have permitted our airship people to work quietly and without interference upon the completion of the two large rigids, R.100 and R.101. With the "season" approaching its end, it was inevitable that the subject of lighter-than-air craft should be revived by the daily press, and as was to be expected the antagonists of airships have started their annual campaign. Whatever may be one's personal views of the chances of ultimate success of large airships, this country is definitely committed to an airship policy, and matters have progressed too far for any radical change in that policy to be feasible. That being the case, it does appear rather unfair to those who are doing the actual work of airship development to launch out at the present moment with criticisms and depreciatory comments which cannot possibly be based upon an intimate knowledge of all the real facts. It is the fashion in some quarters always to applaud what is being done abroad, and to deride any effort made at home. Yet the fact remains that at the present moment Great Britain's aeronautical star is very much in the ascendant. We have won the Schneider Trophy, and we have established a world's speed record, to mention but two recent outstanding achievements in the air. In the light aeroplane movement we lead the world, and we have produced at least one light aeroplane engine which will run for 600 hours without overhaul. With so much serious work, and highly successful work, already accomplished, and more to follow, why pick on one branch of British air activities and assume that the engineers engaged upon that work are fools and incompetents? It is most unjust and very un-British. The engineers who have produced the two new rigid airships have had innumerable obstacles to overcome, difficult problems to solve, and a vast amount of research and experimental work to do before undertaking the actual

### Airships

constructional work. They are staking their reputations on the ultimate results, and by those results they will be judged. Surely that is enough anxiety for them to carry, without making their task more difficult with ill-considered and untimely criticism. If indeed the two airships are a failure, the world will know it, and the designers and constructors will have a heavy responsibility. But why condemn them out of hand? The only reason one can conceive is a hope that the critics will be able to say "I told you so." It is very doubtful whether those same critics, in the case of the airships being a success, will come forward and openly confess that they were wrong. Arguments and discussions are useless at the present juncture. The airship people have but one way of replying to their critics: By deeds and not words. In all fairness to them, let us leave them to get on with their work and thus provide the only answer which in the end is going to count one way or the other.

The last aviation "event" of the year is the meeting being organised by the Newcastle Aero Club and to be held at the Cramlington aerodrome on October 5. At the last moment of going to press with this week's issue of FLIGHT we

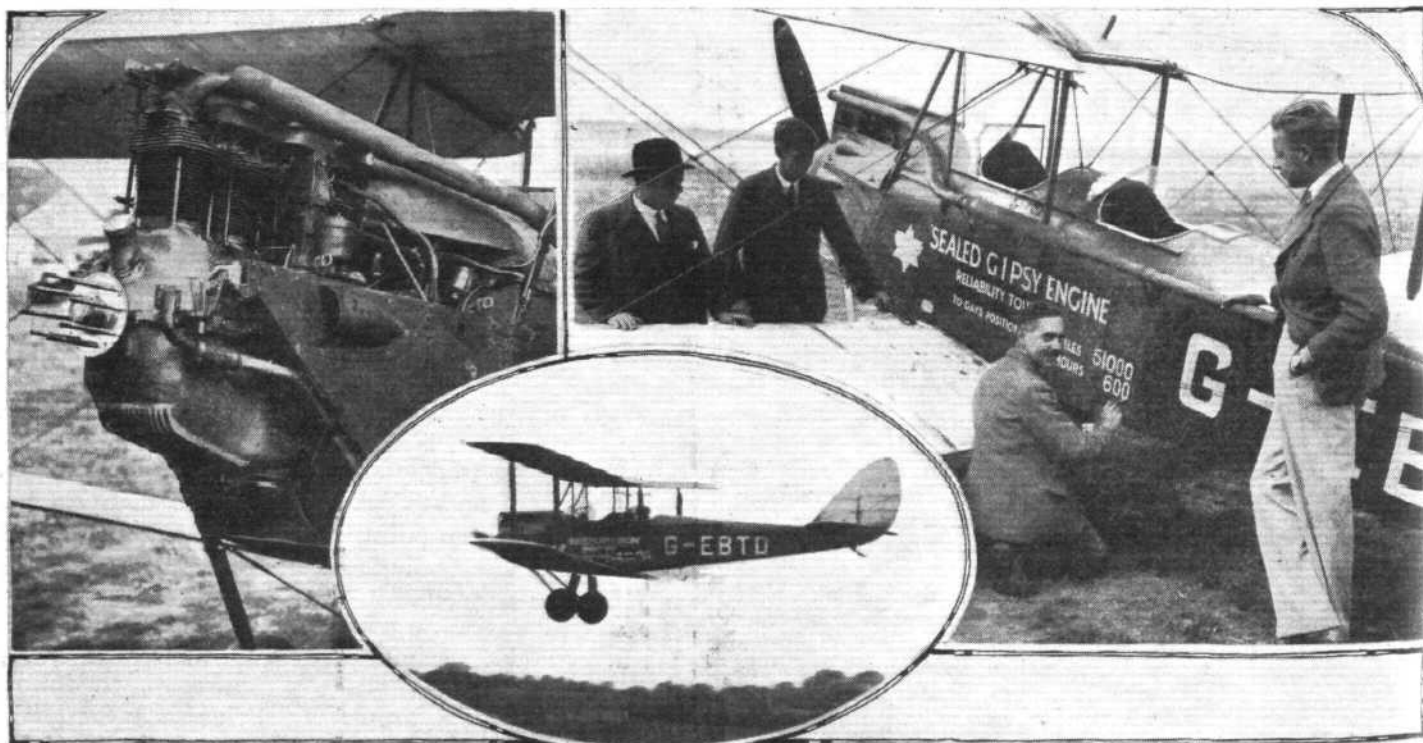
Newcastle have received a list of the entries, which, although not large, is gratifyingly representative, as befits a meeting in which all three races are confined to light aeroplanes, *i.e.*, aeroplanes with an empty weight not exceeding 1,200 lbs. The three races are all handicaps, and are for the Air League Challenge Cup, the Grosvenor Challenge Cup, and the S.B.A.C. Challenge Cup. This year an added sentimental value will be lent to the race for the Grosvenor Cup by the death recently of the donor, Lord Edward Grosvenor, whose enthusiasm for flying was undiminished after nearly twenty

years' connection with aviation, and whose familiar figure was seldom absent from any aviation event. It is to be hoped that Lord Edward's memory will be fittingly upheld by a large participation in the annual event bearing his name. In that way can we best serve the memory of one who did a great deal for aviation, and who had its future very much at heart.

❖ ❖ ❖

On Tuesday morning last the de Havilland "Gipsy-Moth" with sealed engine, made its last landing before the engine was dismantled for examination. When the wheels of the machine touched the ground at Stag Lane, the "Gipsy"

**Reliability** engine had been running for no less than 600 hours without an overhaul, a demonstration of reliability which is probably without a parallel in aviation. The de Havilland "Gipsy" engine was designed by Major Halford and Capt. de Havilland, the first experimental engine being completed in July, 1927, and fitted in the little "Tiger Moth" monoplane. That engine developed about 130 b.h.p., and enabled the "Tiger Moth" to establish a world's speed record in its class. Taking the "Tiger Moth" type of engine as a basis, the compression ratio was lowered and smaller valves fitted, and the engine now known as the "Gipsy" resulted, with an output of 100 b.h.p. The first of what has now become the production type of engine was completed about 18 months ago, and made its first public appearance last year in the King's Cup Race, which it won. Since then the "Gipsy" has become firmly established, and the latest proof of its reliability is provided by the sealed engine which has just completed 600 hours without overhaul. This is a performance of which all concerned may justly be proud.



**1,000 HOURS BETWEEN OVERHAULS:** A few years ago this would have appeared out of the question. Yet the de Havilland "Gipsy" engine, in a "Moth," has just completed 600 hours, so that we are well on the way. One of these photographs shows, Mr. Eadon, who has sat behind the "Gipsy" during a large proportion of the 600 hours, is seen chalking up the final "hourage." Interested onlookers are Mr. Tuck, of the Hoyt Metal Co., who is interested in the bearings, Mr. Collins, an apprentice who has had much to do with the reliability test, and, on the right, G. de Havilland, Jun., one of several pilots who have helped to pile up a mileage of well over 50,000 miles. The "Gipsy" will now be put on the test bench to have power curves taken, and will then be stripped for examination. ("FLIGHT" Photos.)



The Bell Telephone skyscraper on Beaver Hall Hill, Montreal, seen from the air.

## MAPPING THE GREAT OPEN SPACES OF "NEW FRANCE"

DOWN in the Gaspé Peninsula, that good-sized chunk of land that juts out from the Province of Quebec into the Gulf of the St. Lawrence, the natives are very blasé on the subject of aircraft. To them there is nothing exciting in seeing a machine pass, seemingly lazily, across the sky at a height of 10,000 ft. They've seen them before. Nor do they expect the aerobatic performances that are so frequently—far too frequently in the opinion of many—the layman's introduction to aviation. Stunting is no part of the day's work in this out of the way district. Passenger-carrying is, but it is for strictly business purposes, in the nature of long time-saving flights across the Gulf, up the north shore, and to the island of Anticosti, until lately the realm of Menier, the chocolate king, and now industrialised by an almost equally autocratic pulp and paper concern.

The main occupation of these well-behaved, high-flying machines is survey work, and photography and stunting do not mix at all. For some years past, especially in the spring-time of clear, fogless days, and before the trees are in full leaf, aerial mapping on an extensive and intensive scale has been in full swing over the peninsula and along the south shore of the St. Lawrence. Fully 20,000 square miles have been thus mapped to date, and much of the territory covered, although part of the earliest settled division of the Dominion, had never been accurately surveyed until the flying-boat came to do it. Scattered here and there one finds old Seigneuries, granted hundreds of years ago by French kings to influential residents of "New France,"

still owned, some of them, by lineal descendants of the original grantee. Few of these tracts of land, many of which are of enormous area, were correctly shown in the maps. As originally granted, their boundaries were defined by various landmarks, such as rivers, hills, forests, etc., and as the exact course of the streams, and the location of other marks had never been ascertained, the whole problem was one of guesswork. Aerial photography was the ideal medium for such an investigation.

The concern which has been carrying out this interesting and valuable work is the Compagnie Aérienne Franco Canadienne, a Canadian corporation with its head offices in Montreal, and a branch office in the city of Quebec. The funds have been provided by the Province of Quebec, which was quick to see the advantages of this form of surveying.

Although the operating company bears a French name, and uses the technical methods of the Compagnie Aérienne Française of Suresnes, France, it is not a branch of that concern, nor is it in any way controlled by it. It must be remembered that the Province of Quebec is essentially—and, of course, legally—bi-lingual. Hundreds of Canadian companies are registered under their French names, or use a French translation of their ordinary name, particularly in this province. Witness the "Chemin de fer Canadien du Pacifique," better known as the C.P.R. A great deal of advertising is printed simultaneously in both languages, and no better example of this could be found than the accompanying announcement of the Compagnie Aérienne.

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Montreal from above the St. Lawrence. The Royal Bank skyscraper is seen on the left.



In any case, neither flying nor photography depend very much on the language one speaks.

Commencing operation in 1926 with two Schreck F.B.A. flying-boats powered with 180-h.p. Hispano-Suiza engines, and working from a base in the Gaspé Basin and a sub-base at Goose Lake, the company flew 201 hours that year and photographed 3,800 square miles of territory from a height of 10,000 ft. By the early months of this year, they were running twelve F.B.A. machines similar to the ones they started with, and have since acquired two Liore et Olivier flying-boats, one equipped to carry a ton of freight and the other to accommodate eight passengers and their luggage. Both these are powered with Bristol "Jupiter" engines. In addition, there is word of a Farman seaplane "round the corner." Last year's work included the mapping of 7,550 square miles, the carrying of 1,751 passengers, and a total mileage of 53,440 in 668 flying hours.

The main base is at Pointe-aux-Trembles, a short distance down the River St. Lawrence from the city of Montreal, and here is a most completely-equipped establishment. The hangar, with its adjoining workshops, offices, store-rooms and a large veranda overlooking a quiet and picturesque reach of the river, is a monobloc concrete construction, having the largest reinforced concrete roof trusses on the North American continent, their span being 110 ft. Night and day, there is someone on duty at this base, which runs with the precision of clockwork. The organisation is a credit to Capt. M. J. Quedrue, the managing director, and a French ex-naval officer who saw much service during the war. The chief pilot, Albert Monville, who is in command of the base, lives next door to it. Here machines are not scattered about

the river, at buoys or otherwise. An efficient method of handling makes it possible to run a 'plane from the shed to the water or vice versa in a minimum of time, and each night, the "appareils" (to quote Capt. Quedrue's standing orders) are put away in the hangar and the key is handed to the night watchman. These standing orders are a delight to read, after acquaintance with the slapdash manner in which some flying enterprises are carried on. They are the essence of conciseness. Every employee is informed just what his duties are, and who, if anyone, is to help him. Each phase of the conduct of the various bases, from the cleaning of the lavatories to the provision of cotton wool for the ears of passengers, and the price at which petrol is to be retailed to the public, is covered in detail.

There are sub-bases at Lachine, Gaspé, Val Brilliant, Sillery (near Quebec), New Richmond, Lac Ste. Anne, Nominique, Megantic, and Notre Dame du Lac. At each of these points the same provision is made for the accommodation of machines, and good care is evident when one inspects their fleet. The photographic and draughting studios are in the city of Quebec, under the superintendence of Mr. G. Ravit, the technical director.

Aerial survey crews work in units of three men—pilot, mechanic and photographer—and a machine. Receiving a basic scale of pay, these men are encouraged to work together, and it is to their individual and united interest to "produce the goods," for each receives a substantial bonus on the successful completion of the particular operation to which they have been assigned. Part of the mechanic's bonus disappears in the event of trouble with engine or machine; damage to a plane by a pilot is reflected in a



A fine aerial view of the old City of Quebec.

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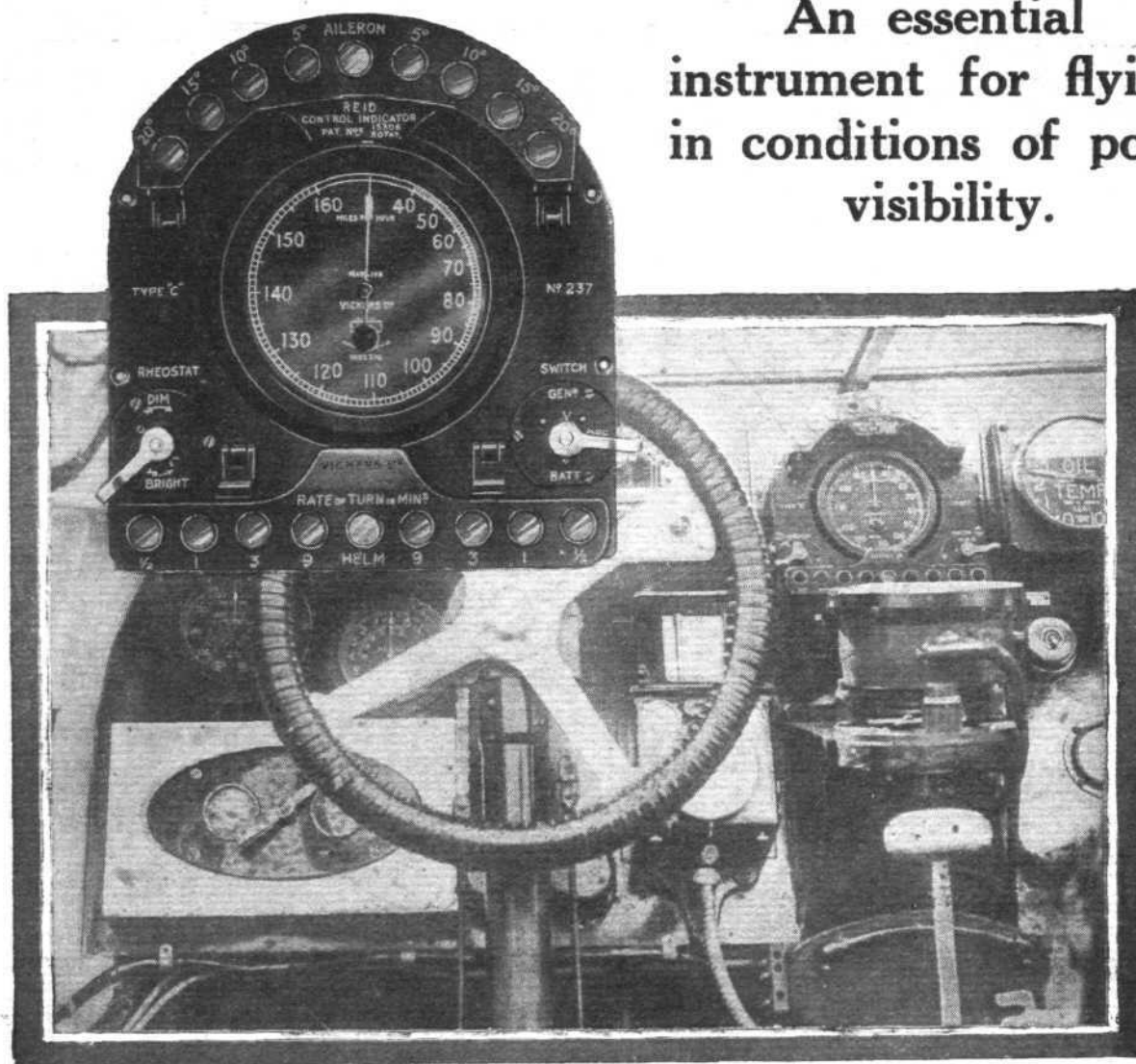
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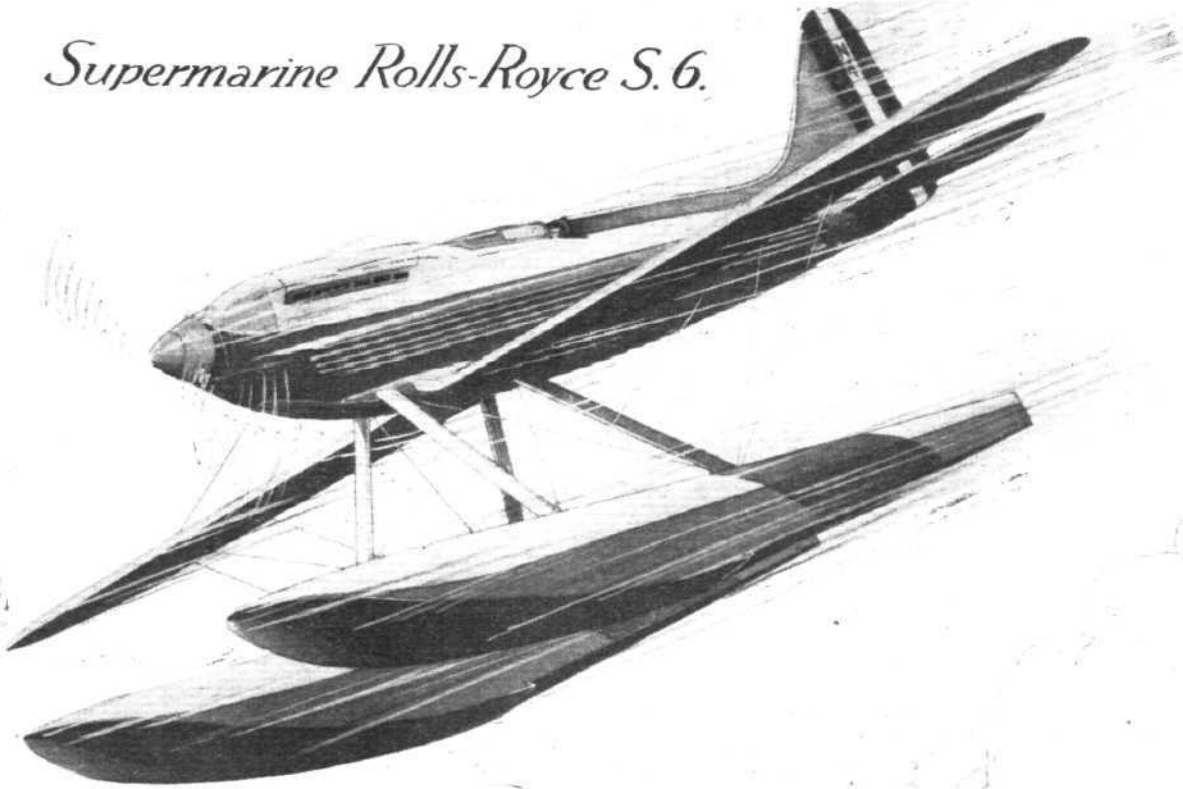
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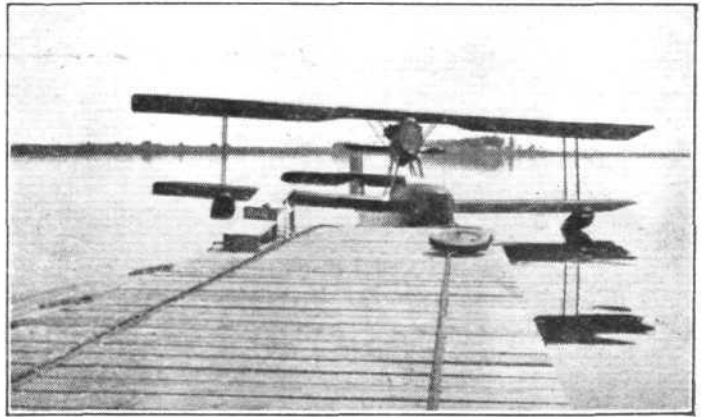
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Flying-Boats used by the C.A.F.C. at the Point-aux-Trembles base : On the left, the Liore et Olivier freight carrier, and, right, one of the Schreck F.B.A.'s.

smaller cheque for him, and so on. Photography, especially from 10,000 ft., is not possible every day; sometimes results may only be obtained on one or two days in a month. The loss of such a rare opportunity through failure of personnel or material would be a particularly serious matter. Stunting is prohibited, on pain of instant dismissal.

A branch of their photographic work that the company is doing its best to make known both in Canada and the United States is that connected with town-planning, or "Urbanism." This is one of the most important functions of the Compagnie Aerienne Francaise, and is one that the Canadian concern is well equipped to undertake. Prospects are promising in this direction, and there is little doubt that the advantages and economy will be quickly appreciated once the idea is "sold" to a few more municipalities. The company is at pains to correct the erroneous belief that aerial town-planning sounds the knell of the ground crew, as they have discovered, on more than one occasion, that "sales-resistance" (to use another very descriptive Americanism) has been fostered by surveyors who were in fear of being superseded. A ground canvas will always be necessary for the establishment of triangulation points and for obtaining data on gradients and distances, and the claim is made that so far from being injured, surveyors, as a whole, will benefit from the rapidity with which such work can be conducted

in conjunction with aircraft, and the consequent increase in the volume of work that will ensue. The company is always glad for this ground check-up to be carried out by the regular employees of any municipality or corporate body for whom they may be mapping, but they have their own staff of highly-trained men to use where local talent is not available.

The Compagnie Aerienne Franco Canadienne has a record in keeping with Canadian traditions as regards accidents. No passenger has ever been killed or injured, and the only misfortune was the loss, on October 18, 1927, of their then chief pilot, Count de Lesseps, son of the world-famous Suez and Panama canal engineer, and a veteran airman, with his mechanic, Mr. Chichenko.

No account of this enterprising company would be complete without a word of appreciation of Capt. Quedrue's "right-handman," who happens to be a most capable woman—Miss Claudine Brais. A native of Montreal, this lady has in the past two or three years established herself as an expert, not only on the business side of the firm's operations, but in matters of flying and photography as well. She flies regularly in the course of duty, has an intimate appreciation of the problems involved, and is a good judge of pilots and machines. These qualifications, added to a delightful personality, make Miss Brais one of the outstanding figures of Canadian aviation.

A. H. S.



The Lachine Rapids, with the power-house in the foreground, photographed from the air.

## PRIVATE



## FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

## PRIVATE OWNERSHIP

THE number of private owners continues to grow with great rapidity and has now reached a total of 153.

The following is the complete list up to September 19:—

Owner	Machine	Letters	Owner	Machine	Letters
W. Adamson ..	Ryan-Brougham ..	G-AAEK	C. Hammersley ..	D.H. Moth ..	G-AALN
Maj. G. G. Allen ..	D.H. Moth ..	G-AAKW	W. L. Handley ..	S.E. 5 A ..	G-EBTO
G. H. Ambler ..	D.H. Moth ..	G-AAJJ	E. G. Hayes ..	Avro Avian III A ..	G-EBYA
L. J. Anderson ..	Avro 504 K ..	G-AACG	A. F. Hill ..	D.H. Moth ..	G-EBOT
G. W. Andrews ..	D.H. Moth ..	G-EBST	A. P. Holt ..	Fokker F VII 3m ..	G-EBZT
H. V. Ashworth ..	Avro Avian III A ..	G-EBXJ	W. L. Hope ..	D.H. Moth ..	G-AAHD
Lady Bailey ..	D.H. Moth ..	G-EBTG	C. E. Horne ..	D.H. Moth ..	G-AAET
Capt. W. R. Bailey ..	D.H. Moth ..	G-AAEE	L. F. Horne ..	D.H. Moth ..	G-AAJN
O. S. Baker ..	Supermarine Solent ..	G-AADC	R. Ince ..	D.H. Moth ..	G-AAKI
Group-Capt. J. A. Baldwin ..	D.H. Moth ..	G-AAAB	L. Ingram ..	D.H. Moth ..	G-AAHO
T. S. Baldwin ..	D.H. Moth ..	G-AAAS	Lord Invernairn ..	D.H. Moth ..	G-AAEP
Capt. H. H. Balfour ..	Avro Avis ..	G-AAKX	J. D. Irving ..	Wee Bee ..	G-EBJJ
Hon. H. C. Bathurst ..	D.H. Moth ..	G-EBKP	A. M. Jackaman ..	D.H. Moth ..	G-AADA
Duchess of Bedford ..	D.H. Moth ..	G-EBWX	Lieut. G. Kidston, R.N. ..	D.H. Moth ..	G-EBRI
Lieut. R. R. Bentley ..	D.H. Moth ..	G-AAHF	H. M. King ..	D.H. Moth ..	G-AADX
W. G. Black ..	Fokker VII A ..	G-AAAO	R. H. Knight ..	D.H. Moth ..	G-AAJV
R. J. Boyd ..	D.H. Moth ..	G-EBTS	E. V. S. Lacey ..	D.H. Moth ..	G-EBWL
J. T. Briggs ..	D.H. Moth ..	G-EBSO	W. N. Lancaster ..	D.H. 53 ..	G-EBRK
Miss W. S. Brown ..	D.H. Moth ..	G-AAFO	H. R. Law ..	D.H. Moth ..	G-AAJW
R. A. Bruce ..	D.H. Moth ..	G-AAGZ	Hon. F. H. Lea-Smith ..	Avro Avian ..	G-EBTU
Capt. C. S. Burt ..	Westland Widgeon III ..	G-AALS	Miss C. R. Leathart ..	D.H. Moth ..	G-EBYJ
A. S. Butler ..	D.H. Moth ..	G-EBVZ	F. S. Lee ..	Sopwith Grasshopper ..	G-AALR
J. E. Carberry ..	D.H. Moth ..	G-EBRL	Sqdn.-Ldr. R. S. Leslie ..	Avro Avian III ..	G-EAIN
G. R. Carpenter ..	D.H. Moth ..	G-AADH	B. E. Lewis ..	D.H. Moth ..	G-EBSD
S. B. Cave ..	D.H. Moth ..	G-AAAC	G. Linnell ..	D.H. Moth ..	G-AAJM
R. G. Cazalet ..	Westland Widgeon III A ..	G-AAHT	G. R. Malcolm ..	D.H. Moth ..	G-AAKE
J. P. Chalmers ..	D.H. Moth ..	G-EBZL	Wing-Com. E. R. Manning ..	D.H. Moth ..	G-AAET
F./O. J. Clarke ..	Clarke Cheetah ..	G-AAGM	J. H. McClure ..	D.H. Moth ..	G-AAFK
Mrs. A. Cleaver ..	D.H. Moth ..	G-EBRM	G. Merton ..	D.H. Moth ..	G-AAAI
E. Cohen ..	Avro Avian IV ..	G-AACO	A. Methley ..	D.H. Moth ..	G-EBUR
C. Coombes ..	Simmonds Spartan ..	G-AAJK	F. G. Miles ..	D.H. Moth ..	G-EBQZ
R. P. Cooper ..	D.H. Moth ..	G-AAEA	T. O. Mills ..	D.H. Moth ..	G-AAKD
D. H. Corsillis ..	D.H. Moth ..	G-AAGR	L. C. Mitchell ..	Westland Wood Pigeon II ..	G-EBPA
W. P. Cubitt ..	Avro Avian IV ..	G-AAHA	Sir P. J. Mostyn ..	D.H. Moth ..	G-AAFX
F. T. Dawson ..	D.H. Moth ..	G-AAAV	R. G. Murray ..	D.H. Moth ..	G-AAFL
Capt. G. de Havilland ..	D.H. Moth ..	G-AAFI	H. R. Murray-Philips ..	D.H. Moth ..	G-EBJV
A. C. Douglas ..	D.H. 53 ..	G-AAHE	C. S. Napier ..	Westland Widgeon III A ..	G-AABJ
Marquis of Douglas and Clydesdale ..	D.H. Moth ..	G-AAAA	Maj. A. A. Nathan ..	D.H. Moth ..	G-EBWA
D. H. Drew ..	Fokker F VII ..	G-EBYI	T. H. Naylor ..	D.H. Moth ..	G-EBWD
H. S. Eaton ..	D.H. Moth ..	G-AAJA	N. Norman ..	D.H. Moth ..	G-AADE
P. T. Eckersley ..	Avro Avian III ..	G-AABX	L. R. Oldmeadows ..	S.E. 5 A ..	G-EBYV
H. A. Edwards ..	Avro Baby ..	G-EAUM	Lord Ossulton ..	D.H. Moth ..	G-AABO
D. K. Fairweather ..	Avro Avian II ..	G-EBTY	J. S. Oliver ..	D.H. Moth ..	G-AAHI
A. B. Ferguson ..	D.H. Moth ..	G-AAEF	H. M. Pearson ..	Austin Whippet ..	G-AAIB
L. J. P. Fowler ..	D.H. Moth ..	G-AAKG	E. Percival ..	Avro Avian III A ..	G-EBZG
F. Francis ..	D.H. Moth ..	G-AALE	H. Petre ..	D.H. Moth ..	G-EAPF
Lieut.-Col. A. H. Gault ..	D.H. Moth ..	G-AAGA	A. C. Pollack ..	D.H. Moth ..	G-EBYR
A. H. Gee ..	D.H. Moth ..	G-EBMF	Sqdn.-Ldr. H. M. Probyn ..	Westland Widgeon III ..	G-EBWZ
F. J. Grant ..	Surrey Flying vices, A.L.I. ..	G-AALP	R. C. Quilter ..	D.H. Moth ..	G-EBPR
O. Greig ..	H.F.S. II ..	G-AAEY	E. K. Rayson ..	Avro Avian III ..	G-EBQR
Sqdn.-Ldr. F. E. Guest ..	Junkers F 13 ..	G-EBZV	Dr. E. D. Whitehead-Read ..	S.E. 5A ..	G-AADO
" ..	D.H. Moth ..	G-AABK	A. J. Richardson ..	Westland Widgeon II ..	G-EBWR
" ..	D.H. Moth ..	G-AALK	Lieut. L. G. Richardson, R.N. ..	Klemm ..	G-EBCA
" ..	D.H. Moth ..	G-AALU	Sir P. Richardson ..	D.H. Moth ..	G-EBJT
Hon. A. E. Guinness ..	D.H. Moth ..	G-AAFM	J. D. Roberts ..	D.H. 50 A ..	G-AAFU
Hon. L. Guinness ..	D.H. Moth ..	G-AAJO	W. G. Robson ..	D.H. Moth ..	G-EBPQ
S. S. Halse ..	D.H. Moth ..	G-EBYS	W. L. Runciman ..	D.H. Moth ..	G-EBQI
D. J. Hamilton-Lister ..	Avro Avian III ..	G-EBVA	Sir P. D. Sassoon, Bt. ..	D.H. Moth ..	G-EBZO
C. Hammersley ..	D.H. Moth ..	G-EBQE	G. T. Scaramanga ..	D.H. Moth ..	G-ABDW
					G-ABWT
					G-AARD
					G-AAJP

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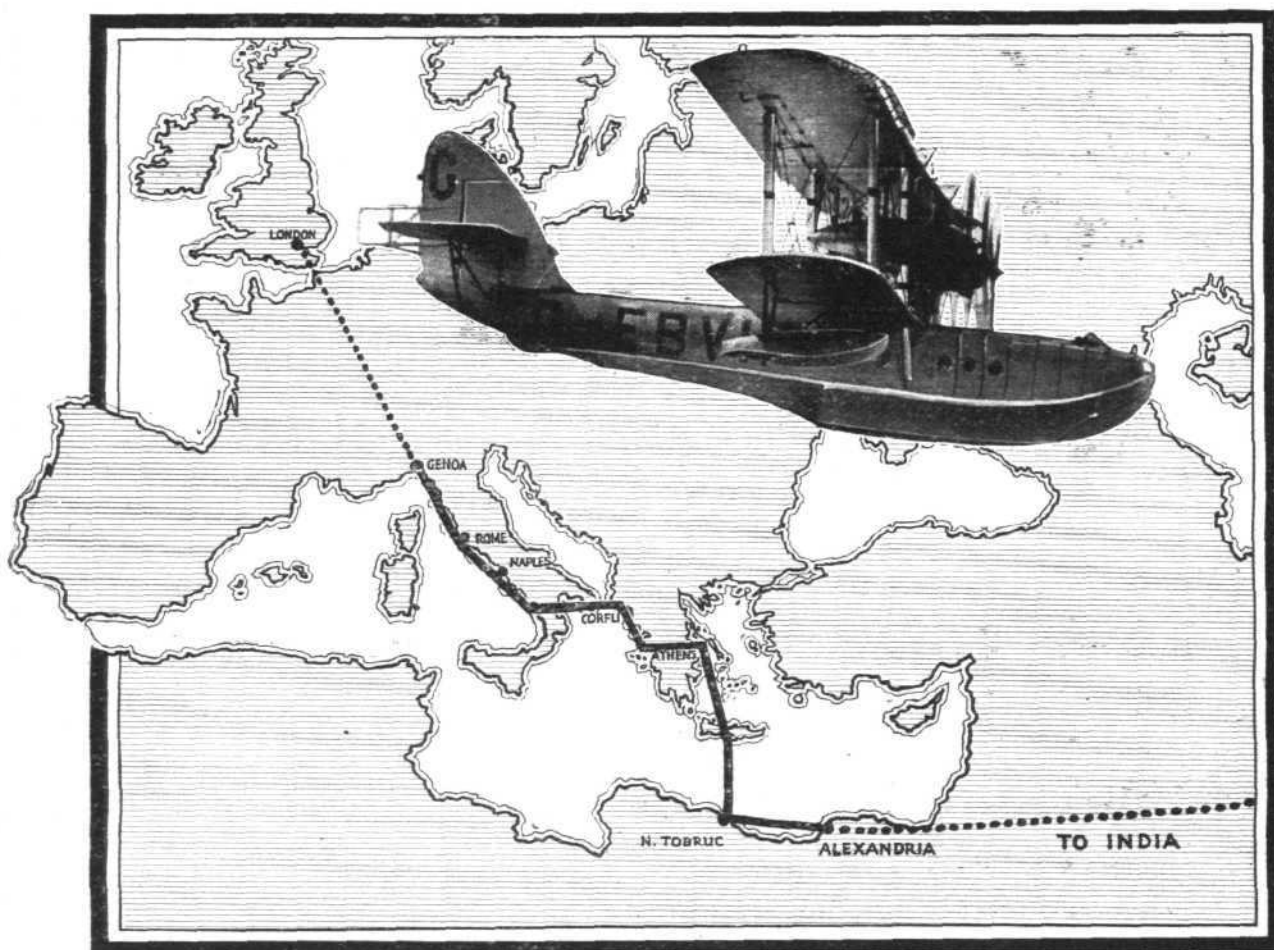
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Owner	Machine	Letters
R. J. Scarlett ..	D.H. Moth ..	G-AAAE
D. S. Schreiber ..	D.H. Moth ..	G-AAEW
Miss E. M. Scott ..	Avro Avian III ..	G-EBYO
J. Scott-Taggart ..	D.H. Moth ..	G-AADV
F. O. A. F. Scroggs ..	Westland Wood Pigeon	G-EBIY
J. L. Shand ..	D.H. 53 ..	G-EBQP
G. D. Shellabear ..	D.H. Moth ..	G-AAHU
The Rev. F. A. Simpson	D.H. Moth ..	G-AAJL
Miss E. J. Slade ..	D.H. Moth ..	G-AAEN
Sqdn.-Ldr. F. O. Soden	D.H. Moth ..	G-EBSA
Miss W. E. Spooner	D.H. Moth ..	G-AAEL
G. E. Stedall ..	D.H. Moth ..	G-AARB
G. E. Story ..	D.H. Moth ..	G-AAAL
Col. H. J. Streatfield	D.H. Moth ..	G-AAKO
W. P. Taylor ..	D.H. Moth ..	G-EBTZ
D. F. Tennant ..	D.H. Moth ..	G-AAHX
E. H. Thierry ..	D.H. Moth ..	G-AAIA
J. H. Thompson ..	D.H. Moth ..	G-EBZP
R. N. Thompson ..	D.H. Moth ..	G-EBZI
B. S. Thynne ..	Simmonds Spartan ..	G-AAAC
E. M. Tiarks ..	D.H. Moth ..	G-AAAZ
Miss O. M. Tremayne-	D.H. Moth ..	G-AAGY
Miles		G-AAHB
A. P. Turner ..	Avro Avian ..	G-AAEU
K. Twemlow ..	D.H. Moth ..	G-AAHN
S. P. Tyzack ..	D.H. Moth ..	G-EBLV
A. F. Wallace ..	D.H. Moth ..	G-AAGS
D. N. Watt ..	S.E. 5 A ..	G-AAHG
Air-Com. J. G. Weir	Autogiro ..	G-EBOG
		G-EBYY

Owner	Machine	Letters
Hon. Mrs. A. F. West-	D.H. Moth ..	G-AAJZ
enra		
Hon. R. Westenra ..	D.H. Moth ..	G-AAFC
F. O. A. H. Wheeler	A.N.E.C. II ..	G-EBJO
P. A. Wills ..	S.E. 5 A ..	G-EBQM
Miss M. D. Wilson ..	D.H. Moth ..	G-EBOI
C. G. Wood ..	Klemm ..	G-EBRY
G. A. North ..	D.H. Moth ..	G-AAAD
T. H. North ..	D.H. Moth ..	G-EBSP
Sqdn.-Ldr. C. S. Wynne-	D.H. Moth ..	G-EBVJ
Eyton		
A. H. Youngman ..	D.H. Moth ..	G-AALF

#### Summary

139 owners with one machine.  
13 owners with two machines.  
1 owner with four machines.  
Total: 153 private owners with 169 machines.

115 Moths	1 Avro Avis
14 Avro Avians	1 Clarke Cheetah
6 Westland Widgeon	1 Avro Baby
6 S.E. 5 A's	1 Austin Whippet
3 D.H. 53's	1 D.H. 50 A
3 Fokker F VII's	1 Cierva Autogiro
2 Simmonds Spartans	1 A.N.E.C. II
2 Avro 504 K's	1 Sopwith Grasshopper
2 Westland Woodpigeon	1 S.F.S. A.L.I.
2 Klemm's	1 H.F.S. II (Gadfly)
1 Ryan Brougham	1 Junkers F.13
1 Supermarine Solent	1 Beardmore Wee Bee

#### D.H. ITEMS

##### Gipsy Moth for Zagreb Aero Club

THE Aero Club of Zagreb has placed an order for a Gipsy Moth. This machine is now on its way to Zagreb, flown by Mr. Riley, of the de Havilland School of Flying.

##### Gipsy Moth Seaplanes for Naval Section of the Yugoslavian Air Force

AN order has been received for four Gipsy-Moth seaplanes from the Naval Section of the Yugo Slavian Air Force. These will be used for training purposes. Below is a complete list of Air Forces now using Gipsy Moths:—British Royal Air Force, Royal Australian Air Force, Royal Canadian Air Force, South African Air Force, Irish Free State Army Air Corps, New Zealand Ministry of Defence, Chilean Military Air Force, Italian Royal Air Force, Royal Danish Flying Corps and Naval Air Service, Greek Naval Air Service, United States Army and Navy, Portuguese Naval Air Service and Yugo Slavian Naval Section.

##### Moth Service Station at Berlin

THE company possesses a live agent in Germany in Herr Friedrich, who in the German Air Force had a distin-

guished record during the war. Now that Moths are being supplied in increasing quantities to Germany, Herr Friedrich has established a full-sized Moth Service Station at Templehof Aerodrome, outside Berlin. Moth owners can obtain all attendance, petrol and oil, any spare parts which they may require, and repairs are executed at short notice. For this purpose an excellent workshop has been set up, equipped with modern machine tools.

Herr Friedrich is very anxious that all owners of Moths, actual and prospective, should have these facilities brought to their notice.

A complete new Gipsy Moth is always in stock.

##### The Queensland Aerial Derby

THE Queensland Aerial Derby, just flown, was won by Mr. Brain, one of Queensland and Northern Territory Aerial Services, Ltd., pilots, in a Moth. Moths being also second and third in a field of 30 competitors.

##### Metal Gipsy Moth for Sir Philip Sassoon

SIR PHILIP SASSOON, President of the Royal Aero Club, has placed an order for a metal Gipsy Moth landplane. This will be specially finished, and very fully equipped.

##### Spartan Modifications

THE latest Spartan has been modified as regards the wings and the cowling. The span of the wings has been increased 4 ft—that is, 2 ft. on each wing—and the result has been to increase the climb and take-off very appreciably and to bring the landing speed down to 36 m.p.h. The cowling is also unique in that it is the nearest approach to the car-bonnet type that has yet been seen on a light aircraft;

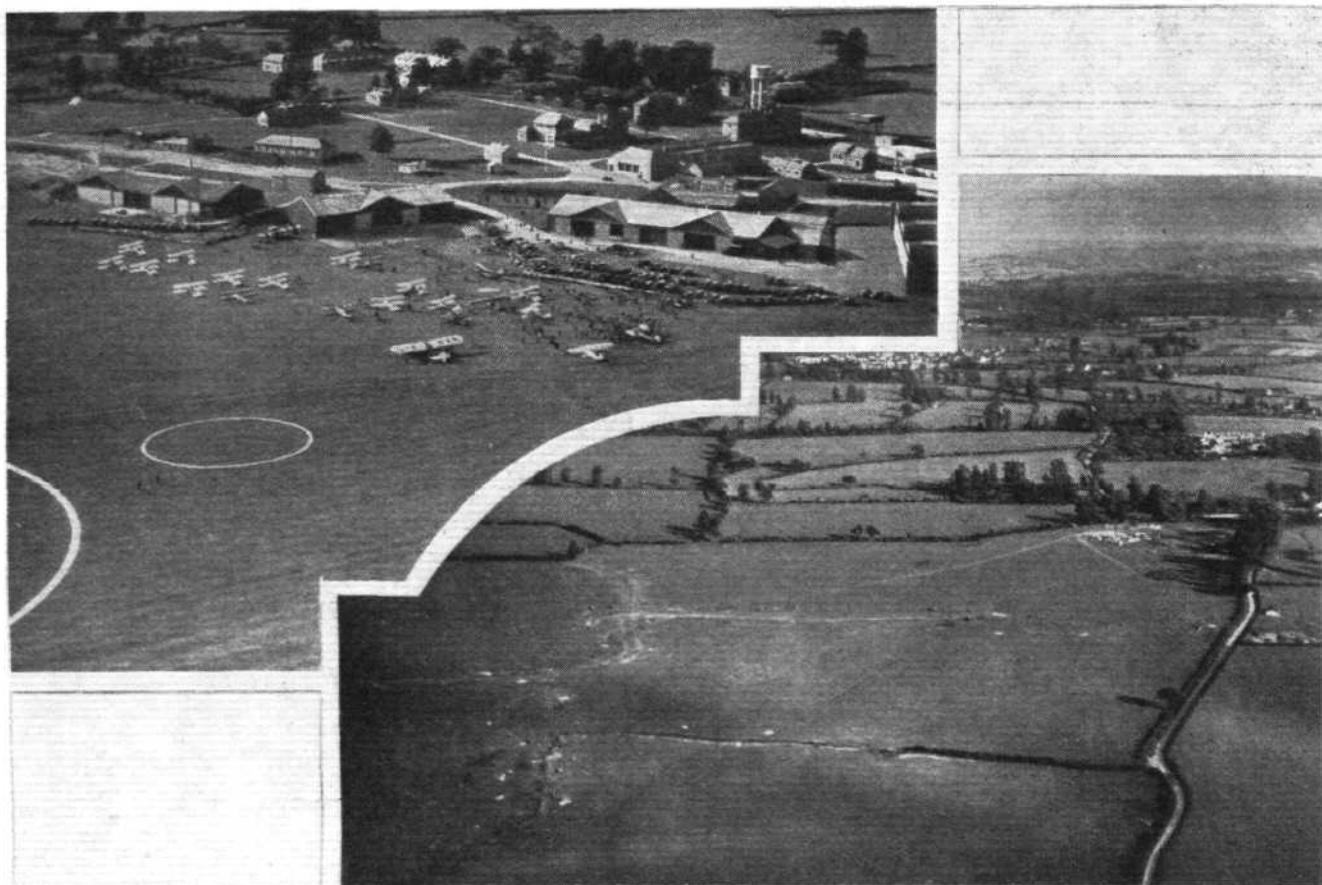
it is entirely separate from the engine, which can be removed without in any way disturbing the fixings for the cowling. Both sides are hinged and lift up, allowing easy inspection of the engine.

Also, temperature tests have shown that this type of cowling, although totally enclosing the engine, do not impair its cooling and, in fact, keep it cooler than most cowlings which leave the cylinder heads exposed.

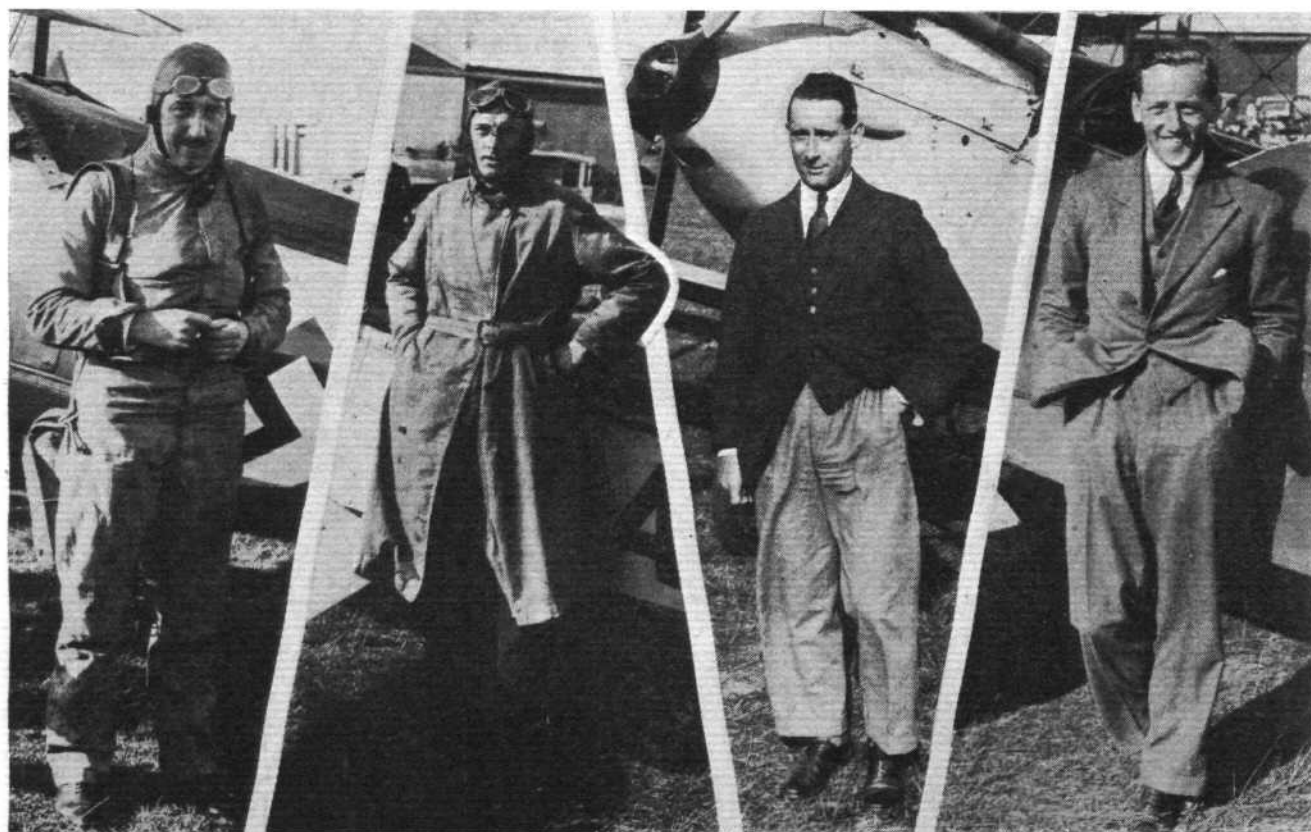


The new long-span  
Simmonds Spartan  
with the new car-type  
engine cowling.

## FILTON'S FAREWELL

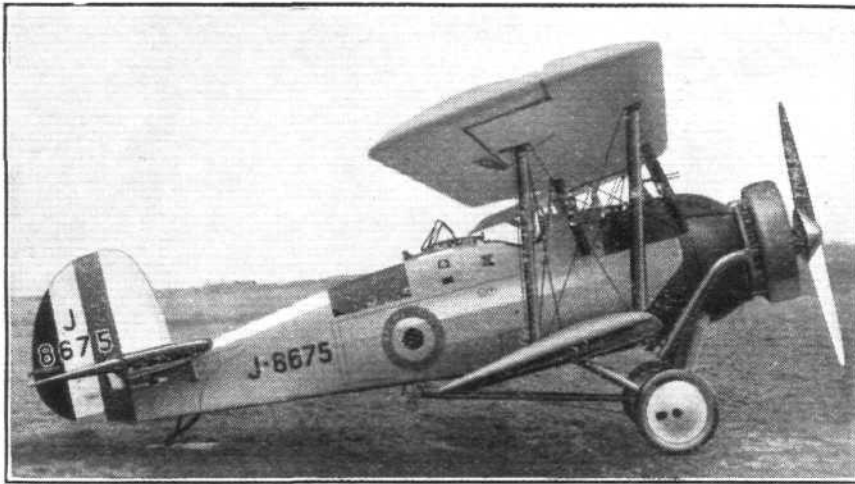


THE OLD AND NEW : Aerial Views showing Filton as it was on Sunday and the new aerodrome at Whitchurch (under construction), to which the club will soon be moving. ("FLIGHT" Photos.)



CAUGHT AT FILTON.—Left to right : C. F. Uwins, who showed off his "Bulldog" to advantage, O. Greig demonstrating the "Gadfly," E. W. B. Bartlett, the Bristol Club Instructor, and Capt H Broad, of De Havillands. ("FLIGHT" Photos.)

# ARMSTRONG WHITWORTH AIRCRAFT



## THE ALL-STEEL ATLAS

(ON WHEELS, FLOATS OR SKIS)



HE all-steel Atlas is the best aircraft for land or sea reconnaissance.

It is the standard Army Co-operation two-seater of the Royal Air Force.

Its steel construction accounts for its unrivalled durability and ease of maintenance. Fitted with the world-famous Armstrong Siddeley Jaguar engine (plain or geared type), its speed, climb and ceiling fulfil the severest Service requirements. It is produced on the grand scale by the best equipped aircraft works in Europe.

### PERFORMANCE FIGURES

#### ATLAS WITH JAGUAR ENGINE AND TOWNEND RING

Fuel, 75 gallons (337 litres). Oil, 7 gallons (32 litres). Military Load, 880 lbs. (400 kgs.)

	Plain Engine.	Geared Engine		Plain Engine.	Geared Engine.
Approx. total weight	4000 lbs. 1820 kgs.	4115 lbs. 1870 kgs.	Time to 5000 ft.	5.25 minutes	4.25 minutes
			" " 10000 ft.	12.5 "	10.5 "
Speed at ground level	143.5 m.p.h.	149 m.p.h.	" " 15000 ft.	26 "	21.75 "
	231 km.p.h.	240 km.p.h.	" " 1000 mtrs.	3.5 "	2.5 "
" " 5000 ft.	139.5 m.p.h.	145 m.p.h.	" " 3000 "	12.5 "	10.25 "
" " 10000 ft.	134 m.p.h.	140 m.p.h.	" " 5000 "	34 "	27.5 "
" " 15000 ft.	125 m.p.h.	131 m.p.h.	Absolute Ceiling	19000 ft.	19100 ft.
" " 1000 metres	226 km.p.h.	236 km.p.h.		5800 metres	5830 metres
" " 3000 metres	216 km.p.h.	225 km.p.h.	Service Ceiling	17300 ft.	17700 ft.
" " 5000 metres	193 km.p.h.	204 km.p.h.		5280 metres	5400 metres
	Maximum allowable R.P.M. 2200. Normal R.P.M. 2000				

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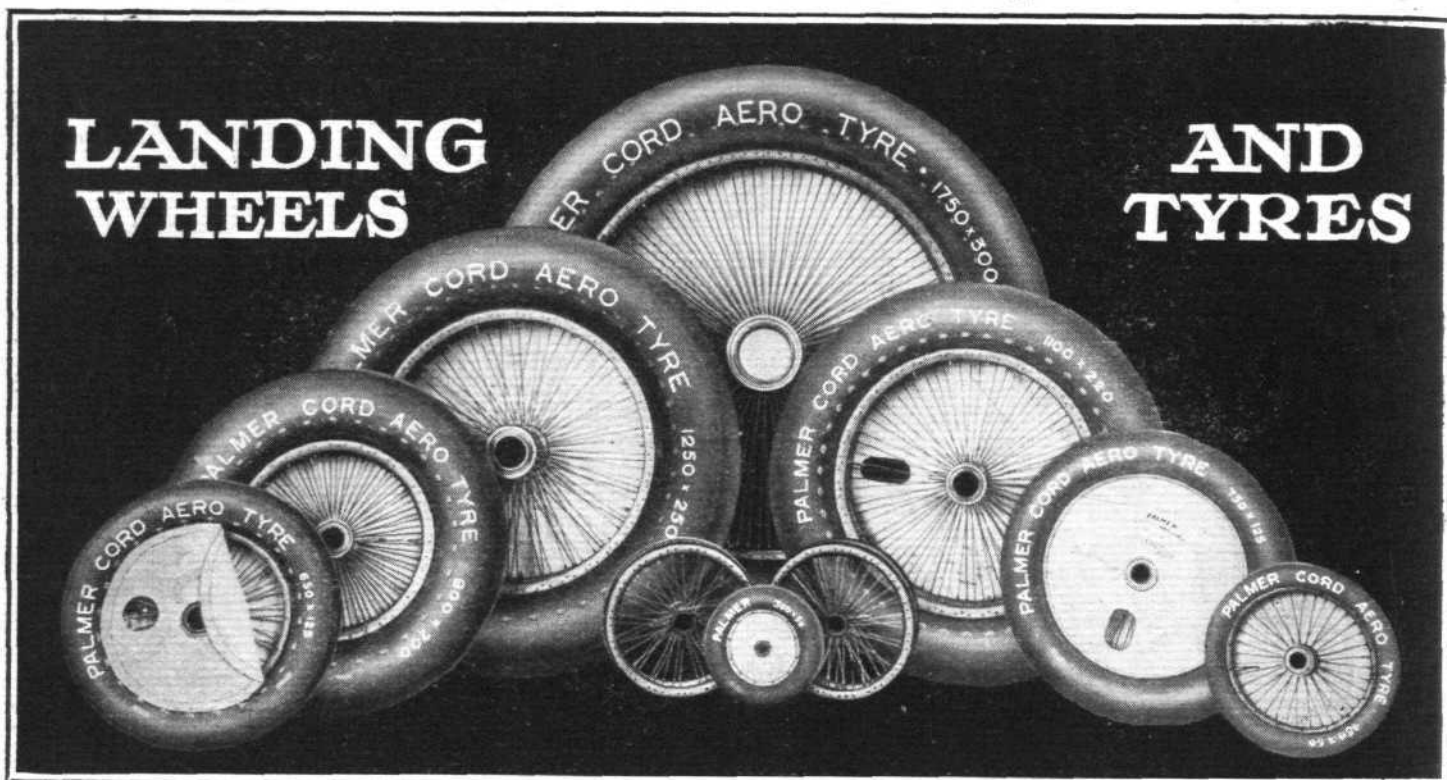


# PALMER



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## AND TYRES



### STANDARD SIZES.

Tyre Size	Wheel No.	Hub		Track Line	Tyre Size	Wheel No.	Hub		Track Line	Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
375 x 55	168	m/m 111.12	m/m 25.4	m/m Central	700 x 100	176	m/m 178	m/m 44.45	m/m Central	1000 x 180	148	m/m 220	m/m 80	m/m Central
"	195	130	38.09	Central	"	179	178	55	132/46	"	149	185	55	Central
300 x 60	16	111.12	25.4	Central	650 x 125	119	178	55	132/46	"	155	220	66.67	Central
450 x 60	30	89	31.75	Central	"	147	178	55	Central	900 x 200	107	185	55	Central
"	172	130	38.09	Central	"	188	120	34.92	132/46	"	108	185	55	Central
575 x 60	21	160	28	Central	"	336	178	44.45	132/46	"	128	220	66.67	Central
"	180	150	38.09	104/46	750 x 125	77	178	44.45	132/46	"	137	250	80	Central
"	186	120	34.92	Central	"	92	185	55	135/50	"	157	185	80	Central
"	190	150	38.09	Central	"	95	185	55	Central	"	202	185	60.32	Central
600 x 75	21	160	28	Central	"	99	178	38.89	132/46	1100 x 220	134	220	66.67	Central
"	180	150	38.09	104/46	"	112	150	38.09	Central	"	136	250	80	Central
"	186	120	34.92	Central	"	176	178	44.45	132/46	975 x 225	192	185	60.32	Central
"	190	150	38.09	Central	"	179	178	55	132/46	"	194	185	55	Central
700 x 75	78	178	44.45	132/46	800 x 150	161	185	55	135/50	1100 x 250	364	220	60.32	Central
"	79	178	44.45	Central	"	162	185	55	Central	1250 x 250	314	250	80	Central
"	100	178	38.09	132/46	"	163	185	66.67	135/50	"	154	304.8	101.6	Central
"	101	178	31.75	132/46	"	169†	185	55	135/50	"				
"	196	178	55	Central	"	177	185	55	135/50	1500 x 300	305	304.8	152.4	Central
600 x 100	188	120	34.92	Central	"	183	185	55	Central	"	306	304.8	101.6	Central
"	304	150	38.09	104/46	"	211*	185	60.32	135/50	1525 x 325	197	304.8	101.6	Central
"	333	120	34.92	Central	1000 x 150	167	185	55	125/60	1750 x 300	139	400	152.4	Central
700 x 100	77	178	44.45	132/46	"	174	250	80	Central	"	191	350	150.3	Central
"	92	185	55	135/50	"	182	185	55	Central	1750 x 350	193	400	125	Central
"	95	185	55	Central	"	187	220	66.67	125/60	2000 x 450	363	500	152.4	Central
"	99	178	38.89	132/46	"	201	185	60.32	Central					
"	112	150	38.09	Central	"	210	185	60.32	Central					

\* Wheels Nos. 161, 162, 163, and 211 are of stronger type than the other wheels for 800 x 150 tyres. † Wheel No. 169 is fitted with Ball Bearings. Grease gun equipment is now a standard fitting on all wheels. (A/NL)

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## FILTON'S FAREWELL

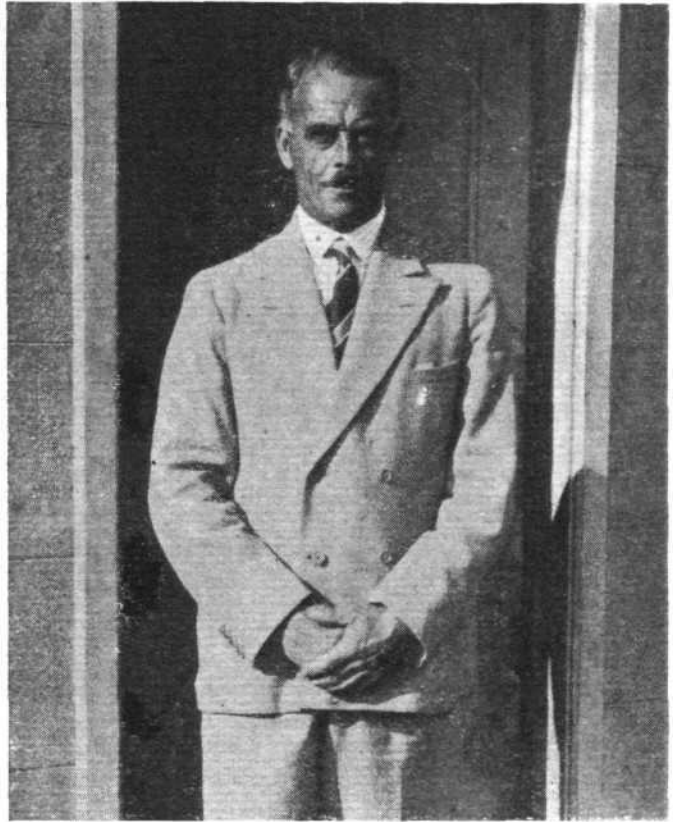
**T**HE Bristol and Wessex Aeroplane Club held their flyers' farewell to Filton last Sunday. Some two dozen machines lent their support, and the clerk of the weather was more kindly disposed than he had been the day before, the result being that everything went off well.

Except that the Autogiro had perforce been eliminated from the programme, the events were run off without hitch.

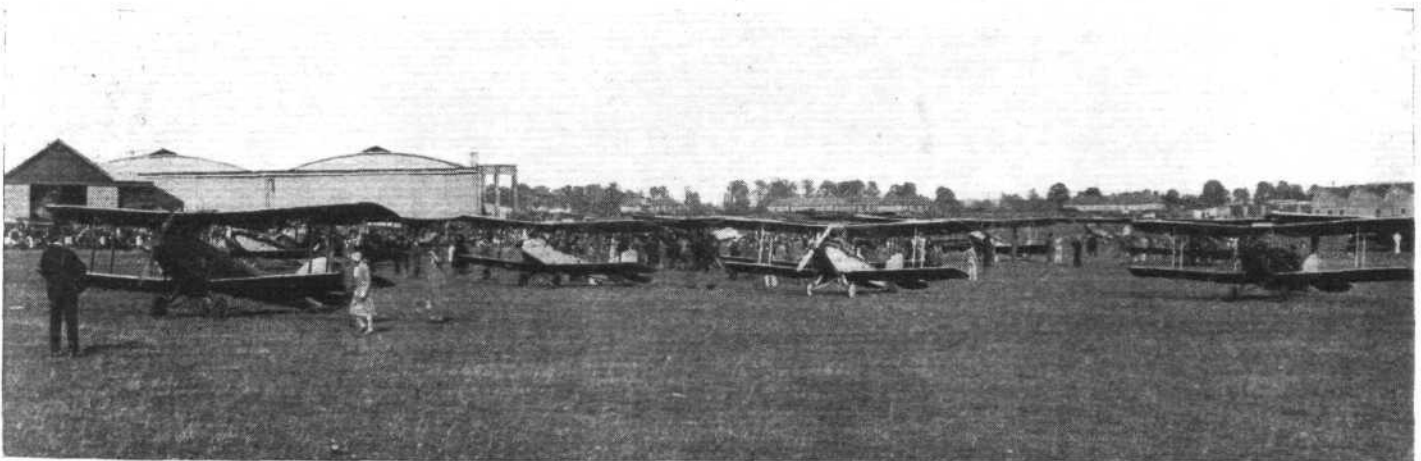
Mr. E. W. B. Bartlett, the Club's Chief Instructor, led off with an excellent show of aerobatics, and was followed by Capt. Broad and Mr. Uwins. Capt. Broad appears to prefer the inverted position to the normal, and perhaps one day we shall see him flying from a suspended seat with the machine on top of him. Mr. Uwins showed what the Bulldog can do, and gave people an idea why it was chosen for the R.A.F.

The weather being unsuitable for the balloon-bursting competition, a bombing competition was substituted. For this event, a table was placed on the aerodrome and the bombers were given three "shots"; quite a large entry was gained for this, and we have not yet heard the result. The winner is to receive the Whiteley Challenge Cup, which he holds for six months, and small prizes were also given for the first three.

A large crowd, estimated at about 10,000, viewed the show from, on or around, the aerodrome, and the committee have every reason to feel satisfied with their work. Being as it was, a farewell to the Filton aerodrome, made the occasion a very special one, and the enthusiasm shown augurs well for the future of the club. During the winter they will be moving into their new aerodrome at Whitchurch. This is a Municipal aerodrome, and is only 10 mins. by car from the tramway centre, so that the club, as a club, should have a good chance of extending their activities by being so close to the city. A very pleasant club-house is being erected, and there will be gardens and possibly tennis courts, which should attract even those who do not fly, but who will help to support the club.



Major G. S. Cooper, Secretary of the Bristol and Wessex Aeroplane Club. ("FLIGHT" Photo)



A general view showing what will probably be the last goodly gathering at Filton. ("FLIGHT" Photo)

## LIGHT 'PLANE CLUBS

### LONDON AEROPLANE CLUB

(AUG. 1-21.)—Total flying time for August.—Dual instruction: 65 hrs. 45 mins. Solo flying: 66 hrs. 30 mins. Passenger flying: 2 hrs. 40 mins. Test flights: 9 hrs. 25 mins.

The club was closed down for the first fortnight of August for the staff holidays.

During the month the following members qualified for their "A" licences: H. Armstrong, E. H. Allen, Hon. Miss M. K. Leith, R. O. I. Muntz.

### BRISTOL & WESSEX AEROPLANE CLUB, LTD.

(AUG. 1-SEPT. 13).—Flying time: 224 hrs. 10 mins. Pupils instructed and hours flown (30): 98 hrs. 15 mins. Soloists and hours flown (11): 33 hrs. Licensed pilots ditto (17): 40 hrs. 25 mins. Passengers carried and hours flown (60): 22 hrs. 30 mins.

The club remained open during the latter half of August while the permanent staff were having their holiday; a weekly average of about 40 hrs. being maintained. Since our last report the following have passed their "A" tests: Messrs. N. H. Smith, J. Hodges, R. A. Rioch, K. G. Potter, Denys Finch-Hatton, A. E. Neale, H. E. Davis and F. D. Butcher. The new Bristol Aerodrome and with it our club-house and hangar are progressing rapidly, and we have been granted permission to occupy our present quarters until

January 1 next if necessary. On Sunday next, September 22, we are having an aerial garden party as a farewell entertainment at this aerodrome. There will be a bombing contest to which all private owners are cordially invited. An Autogiro and we expect other new interesting machines will give displays. Capt. Broad will give, as well as others, exhibitions of aerobatics. It is hoped any private owner intending to come will notify the secretary beforehand and be the guest of the club to lunch. [See above.—ED.]

The Whiteley Challenge Cup will be given for six months to the winner of the competition, which will either be a bombing competition or balloon bursting according to the weather.

There will also be three other prizes.

A really interesting display has been arranged, and many of those who are visiting Mr. Parkhouse at Haldon the day before will be coming on to Filton, and we look forward to a very cheery meeting.

The first dance of the season takes place at the Grand Spa Hotel, Clifton, on October 4. Tickets are available from the secretary, price 5s. each.

### CINQUE PORTS FLYING CLUB, LTD.

(SEPT. 1-7).—Pilot Instructor: K. K. Brown. Ground engineer: R. H. Wynne. Total for week: 27 hrs. 25 mins. Dual instruction: Total 12 members, 15 hrs. 15 mins. Advanced dual: 15 mins. Soloists and:

instruction: Total, 5 members, 6 hrs. 45 mins. "A" pilots: Total, 3 members, 3 hrs. 15 mins. Joyride: 1 hr. 30 mins. Tests: 12, 1 hr. 30 mins. Weather stopped flying on Sunday of this week.

Mr. Thomson was a new member who commenced instruction during the week, and we were glad to welcome back Messrs. Iles and Nicholson, who have been absent from the club for some months.

Thursday, 5th, was an eventful day as Mr. Brown launched Mr. Hyde and Mr. Lambert solo. Both members performed very creditably and on the following day, Mr. Lambert of Bouverie Road, Folkestone, took his "A" licence in good style.

On Saturday, 7th, Mr. J. J. Jones of Pinner, Middlesex, accomplished a good first solo.

(SEPT. 7-14).—Total for week: 27 hrs. 35 mins. Dual instruction: Total, 14 members, 15 hrs. 45 mins. Advanced dual: 1 hr. Soloists under instruction: Total, 5 members, 6 hrs. 15 mins. "A" pilots: Total, 3 members, 1 hr. 15 mins. Tests and special journey: 14, 2 hrs. 15 mins.

Bad visibility interfered with tuition on several days this week. On Thursday, Mr. Hyde passed his "A" licence tests and on Friday, Mr. Fotheringham-Barker of Sydenham was successfully launched solo by Mr. Brown. Amongst new members commencing instruction during this week was Miss J. Giles of London, Mr. Gray of Folkestone and Messrs. Matthew, Cholmeley and Turner of the Small Arms School, Hythe.

We were glad to welcome back Mr. Scott Taggart after his prolonged visit to America.

On Wednesday, Mr. Brown flew R.I. to the Hythe Venetian Fête, with Mr. Wynne as Bomber, for the purpose of bombing a castle on a raft. As a bombing expedition it was not very successful, only one hit being secured, but as an exhibition of flying, the show was absolutely first class, and it was chiefly due to the terrific speed of Mr. Brown's dives, that Mr. Wynne was unable to gauge the right moment to release the bombs. We congratulate Mr. Brown on a very fine performance.

Messrs. A. D. C. Aircraft, Ltd., gave us very good service during this week, four cylinder heads which were dispatched on Wednesday afternoon for complete re-conditioning being returned to us on Friday morning, with the result that the machine P.M. was again in commission on Friday afternoon.

(SEPT. 14-21).—Total for week: 16 hrs. 20 mins.

Weather stopped flying on Wednesday, Friday and Saturday; and, the club being closed on Tuesday, left only three days' flying.

On September 15 Mr. Fotheringham-Parker passed for his "A" licence satisfactorily.

The membership continues to grow, and at a committee meeting nine monthly members, two private owner associate members, and three new full flying members were elected, making 14 new members in a fortnight.

Mr. Cooke has purchased from the Brooklands School of Flying, Ltd., a Cirrus Moth, formerly the property of Capt. F. E. Guest, No. G-EBUS. Mr. Cooke, who was trained by us, took his "A" licence on August 25.

#### HALTON AERO CLUB

(SEPT.).—R. Ae.S.I. Notes.—At the Council meeting on July 10 the following A.A.'s were elected as students: R. G. Buck, R. E. Drake, H. B. Sherman, C. Williamson.

Club Notes.—Schneider Cup Race.—Between 400 and 500 members attended the two-day excursion to Gosport.

Club Badges have now arrived. They are in the club colours, blue and silver, price 1s. 6d. each. Owing to the passing-out of the fourteenth entry six new members are required from No. 1 Wing and those interested are asked to see the Hon. Secretary, Room 25. About 450 new members joined during June and July, making the total nearly 1,000.

#### HAMPSHIRE AEROPLANE CLUB

(SEPT. 6-13).—Pilot instructor: W. H. Dudley. Ground engineers: E. Lenny and S. Riches. Flying time, 58 hrs. 5 mins. Dual instruction, 20 hrs. 15 mins. Solo flying, 7 hrs. 25 mins. "A" pilots, 27 hrs. 55 mins. Instructors, solo and passengers: 2 hrs. 30 mins.

Five new members have joined this week. Messrs. Winn, Woodhouse, Elkins, Boutwood and Cockburn completed successful first solo flights. Mr. Turner passed the tests for his "A" licence and Lieut. Pleydell-Bouverie his height test.

The chartering of a steamer by the Club from which members could view the Schneider Trophy Contest proved a very great success.

The year ended July 30 last was the first for the club under the revised subsidy arrangements. Members will be interested to know that we earned the full £2,000, which was the limit of the grant.

(SEPT. 13-20).—Total flying time for week: 48 hrs.

Our new Moth is unfortunately laid up for a bit as a member cracked a longeron in landing.

#### HANWORTH CLUB

Flying time for the first fortnight: 368 hrs. 100 members have started their instruction. 17 have already gone solo, and 9 have taken their "A" licence. 4,000 miles have been flown on taxi work.

#### HOUSEHOLD BRIGADE FLYING CLUB

The club purchased a Gypsy Moth (G-AADP) on August 15. Flying time to the present date amounts to 60 hrs. Dual: 31 hrs. 45 mins. Solo: 28 hrs. 15 mins.

The following have obtained their "A" licences: Lieut. E. L. Donner, Irish Gds.; Lieut. Sir Robert Throckmorton, Bart., Gren. Gds.; Lord Amherst, late Coldstream Gds.; Capt. the Hon. F. Guest, late Life Gds.

#### LANCASHIRE AERO CLUB

(SEPT. 14-21).—Flying time: 23 hrs. Instruction (With Mr. Hall): Messrs. Braid, Gillett, Johnson, Aspden, J. C. Sellers, Oddy, Griffiths, Fearnshough, Moore, W. Russel, Nuttall, Byrom, Wilkinson, Blake, Shaw, Whitehouse, Gray, Barlow. (With Mr. Scholes): Forshaw and J. C. Sellers.

The weather was poor and no flying was possible on Saturday. Occasionally we say hard things about our private owners, but we are very grateful to one at the moment, who is changing his Cirrus Mark II for a Hermes, and has given us his old engine (and not so very old at that!). We recommend this practice to other private owners, well disposed towards their clubs!

#### MIDLAND AERO CLUB

(SEPT. 7-14).—Total flying time: 30 hrs. 48 mins. Dual, 14 hrs. 5 mins.; solo, 11 hrs. 20 mins.; passenger, 4 hrs. 50 mins.; test, 33 mins.

The following members were given dual instruction by Mr. T. W. J. Nash, A.F.M.: H. A. Taylor, W. H. Craven, T. W. Wild, J. A. Ridsdale, G. Mander,

W. Smith, Harvey Sangster, T. J. Munrow, J. W. Astley, Mrs. Vereker, J. H. Vickers, P. M. Patel, Mrs. Burnett, A. F. Hill, L. W. Farrer, C. Blake-way, B. P. A. Vallance, C. T. Davies, P. Stone, A. H. Westwood, H. Beamish, C. T. Isaac. Advanced dual: S. G. Hall, H. G. Tower, F. Norman. "A" pilots: E. P. Lane, R. D. Bednell, R. L. Jackson, R. C. Baxter, R. B. Laidlaw, F. Norman, K. S. Neale, F. G. Robinson, W. M. Morris, J. Rowley, J. Cobb, E. D. Wynn, W. K. Morton, F. T. Lydall, H. J. Willis. Soloists: H. A. Taylor, T. W. Wild, B. P. A. Vallance, L. W. Farrer, Mrs. Vereker.

Passenger flights were given to 12 members. Messrs. H. A. Taylor, B. P. A. Vallance and Mrs. Vereker carried out the flying test for their "A" licences.

Mr. L. W. Farrer made a very good first solo.

(SEPT. 15-22).—Total flying time: 28 hrs. 48 mins.

The annual general meeting will be held at the White Horse Hotel, Birmingham, on October 9, at 7 p.m., after which it is proposed to hold a supper and smoker.

#### NEWCASTLE-UPON-TYNE AERO CLUB

(SEPT. 8-15).—Total flying time: 57 hrs. 35 mins. Instruction, 28 hrs. 10 mins.; solo training, 14 hrs. 25 mins.; "A" pilots, 12 hrs. 20 mins.; passengers, 1 hr. 40 mins.; tests, 1 hr.

We see from time to time reports in various magazines appertaining to aviation reports about other clubs doing such good business in the way of flying returns, but we may say that the Newcastle Aero Club, although very little mentioned, ranks among those who do a very high number of flying hours. At present, we only have two machines on service, and only one instructor, and great credit is due to him for the manner in which he passes out the number of pupils on his hands. Take, for instance, this week alone; at the beginning of the week Mr. Ali, one of our pupils, did a very creditable first solo flight and, as his time was limited, he completed his tests for the "A" licence; again, Mr. Kendrick recently completed his first solo flight successfully, and on the day previous to Mr. Ali completed his necessary tests for his licence. Thursday saw Mr. Miller do his first solo flight very successfully, and on Friday, Saturday and Sunday we saw three more pupils set off, viz. Mr. Hardy, Miss Charlton and Mr. Rush.

(SEPT. 15-22).—Total flying time: 24 hrs. 5 mins.

Wind blew heavily all the week. On Sunday it dropped towards the evening, and allowed us to do some flying, for which we were very grateful. On Monday two D.H.9's called on their way to Catterick.

#### THE NORTHAMPTONSHIRE AERO CLUB

(SEPT. 14-21).—Total time: 10 hrs. 50 mins.

High winds made flying impossible for two days, resulting in lower flying time. Two new members commenced flying—Mr. B. Skinner of Bedford and Mr. W. McCleery of Naseby.

#### FROM THE FLYING SCHOOLS

##### Brooklands School of Flying, Brooklands Aerodrome

(SEPT. 8-15).—Flying time: 63 hrs.

This week we have received two new pupil owners. In each case we have supplied a new Gipsy-Moth to joint owners, whose names are J. Briggs, G. M. Christian, J. C. Lattey, and the Hon. F. D. H. Lea-Smith. We have also supplied second-hand machines to R. Ruutz-Rees and J. R. Cooke. Three pupils completed their "A" licence tests: Messrs. C. B. Baker, J. H. Chapman and E. H. Buxton.

(SEPT. 15-22).—Flying time: 33 hrs.

The following have joined the school: Messrs. Lang, Rampom, Barnett and Campbell-Order, who is preparing for the Auxiliary Air Force.

Our Clacton season, joy-riding, has finished, and C.A. has returned. We now have three Moths, as well as the Avros.

##### The Phillips and Powis School of Flying

(SEPT. 5-12).—Flying time: 33 hrs.

A record week for us, both as regards flying time and new pupils. Fifteen new pupils have actually joined the school during the last seven days. Mrs. Davies, Dr. Penny and Messrs. Frost, Goodbody, Newman, Hayne, Owen, Pook, Channing Pearce, Aitchison, Piper, Hull, Belcher, Whishaw and Saunders.

Mr. Hayne, who is on leave from Arabia, is on the verge of going solo; a strikingly good performance as he has only received 3 hrs. 55 mins. dual instruction. Messrs. Whishaw and Belcher are also making very good progress and promise to pass out under a week.

Messrs. Skuce, de Fraine, Henderson and Milne, are to be congratulated on passing their "Figure of Eight" test very satisfactorily, and we hope will have passed their height test before these notes appear in print.

On Thursday last we were honoured by a visit from the Right. Hon. Capt. Balfour, M.P., who reported favourably of the aerodrome.

The school was responsible for the sale of an Avro Baby to one of our soloists—Mr. Edwards—at a very reasonable figure. Mr. Edwards we think will find flying cheaper than motoring, as far as interest on capital and depreciation are concerned.

(SEPT. 12-19).—Flying time: 33 hrs. 35 mins.

We have to congratulate Mr. de Fraine and Mr. Milne on passing their test for "A" licence satisfactorily in spite of high winds.

New pupils: Mrs. Lavington and Messrs. May, Turner, Readle and Brightly.

A landing competition was held last Sunday for school soloists, and was won by Maj. Allen, who came to rest 7 yards from the pre-arranged spot. Second place was won by Mr. De Swann with 10 yards.

#### OVERSEAS CLUBS

##### SINGAPORE FLYING CLUB

(JULY 28-AUG. 3).—Total flying time: 18 hrs. 10 mins.

(AUG. 4-10).—Total flying time: 13 hrs. 50 mins.

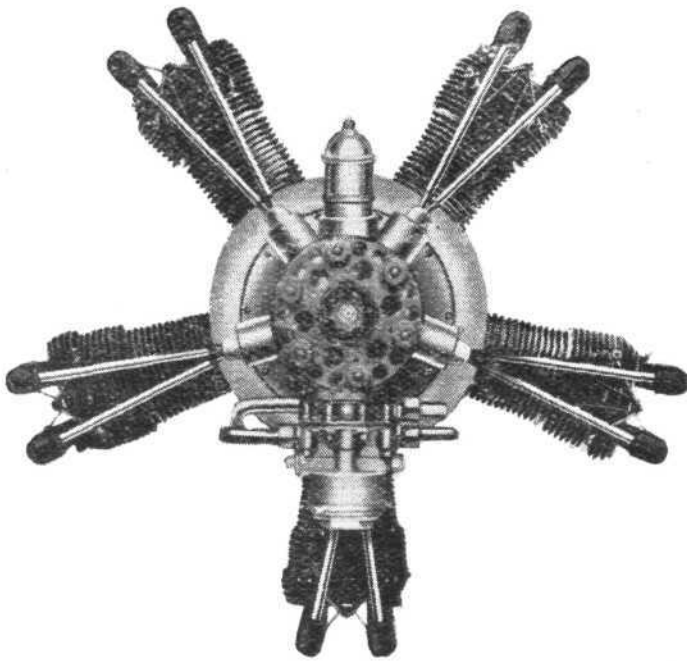
(AUGUST 11-17).—Total flying time: 6 hrs. 50 mins.\*

\* Unfavourable weather conditions were responsible for the small amount of time put in this week.

On August 3 R. R. Gardner, and on August 16 J. C. Alexander, successfully soloed.

Flying time for July was 49 hrs. 10 mins., making the total to date 594 hrs. 27 mins.

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XVI

# The AIRCRAFT ENGINEER

FLIGHT  
ENGINEERING  
SECTION

Edited by C. M. POULSEN

September 27, 1929

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## EDITORIAL VIEWS

As in the case of complete aircraft, so also with aero engines is it a matter of very considerable difficulty to evolve some standard of comparison. Professor Everling has given us the "High-speed Figure," "Distance Figure" and "Altitude Figure" for aircraft (to which he has recently added a fourth, the "Rate of Climbing Power," which will be described in a forthcoming issue of THE AIRCRAFT ENGINEER), but for aero engines we are still without an adequate basis for comparison. Weight per brake horse-power is one, but of itself is not sufficient, since petrol consumption enters largely into the subject, and weight, including fuel for a given number of hours would be a more useful criterion. The complication added by the necessity to include a factor for the propeller efficiency so as to give the weight per thrust horse-power is a further stumbling block. And even if we could assess this with some accuracy, there is still the very important matter of frontal area, which seems to demand some form of expression which will give us "thrust horse-power per unit of frontal area." Were this to be attempted there would doubtless be those who, with a good deal of justification, would argue that this might be an unreliable and misleading basis, since *form* as well as frontal area should be considered, it being conceivable that two engines with the same frontal area per horse-power might have very different drags. So that taking everything into consideration, a really fair and useful basis for comparison of aero engines is difficult to evolve.

In the meantime Mr. Kearley has tabulated, and is commenting upon in the present issue, some of the characteristics of the air-cooled aero engines exhibited at Olympia. Mr. Kearley is a totally unbiased observer to the extent that he is not connected in any way with any aero engine firm, and his remarks will doubtless be read with considerable interest. We are quite prepared to find that readers will join issues with him on certain points, and we shall be pleased to open our correspondence columns in FLIGHT to a discussion of the deductions which the author makes from the comparative data given in his table.

## AN ANALYTICAL REVIEW OF THE AERO ENGINE EXHIBITS AT OLYMPIA.

By N. E. KEARLEY, A.M.I.E.E., A.M.I.A.E.

(continued from p. 61.)

Before passing on to other matters to be dealt with in this review of the engine exhibits at Olympia, it may be observed that the division of the engines among the air- and water-cooled types in the proportion of 60 per cent. and 40 per cent., respectively, shows an exact reversal of the position which existed at the Aero Show held in 1920. This seems at first a little surprising in view of the predominance of the air-cooled engine almost throughout the war; the rotary was, however, fast dying and apart from the radial, which was beginning to re-establish itself in favour, the static air-cooled engine was almost extinct. On the other hand, a large number of new water-cooled engines had appeared during the later stages of the war. Incidentally, an important event that has taken place since the last AIRCRAFT ENGINEER supplement appeared shows that in at least one field the superiority of the water-cooled engine remains unchallenged, namely, for racing purposes. Also, it should be remembered that both the British and World's long distance, point to point, records are held by the water-cooled type. This fact seems somewhat surprising in view of the fact that some extraordinary endurance records have been established by the air-cooled type. In long-distance flying, however, engine reliability is more severely tested than in the case of a duration flight, in which the engine is throttled back as far as possible, and the operating conditions remain far more constant than they do when travelling some thousands of miles from the starting point.

### Air cooled engines

*General Remarks.*—With reference to the physical characteristics of the air-cooled engines, Table 1 has been compiled from the available data, the engines being arranged in order of power in their separate classes. The actual cylinder dimensions, weights, etc., have not been included, due to the necessity for saving space, these having been already given in the tables published in the July 25 issue of FLIGHT. The figures given in Table 1 have been deduced from the previously published tables, the latter having been carefully checked, corrected and supplemented where necessary, for it was inevitable that some slight errors and omissions would occur under the stress of publication during show time.

Firstly, it is of interest to compare the various values of the stroke/bore ratio. It will be noted that excluding the "Scorpion" and "Statux," which mark the two extremes of the variations and are both exceptional, this ratio lies between 1.0 in the "Genet," which incidentally is the only

## THE AIRCRAFT ENGINEER

TABLE 1.—Air-cooled Engines

Normal Output B.H.P.	Name or Type	Maker	No. of Cyls.	Stroke/ Bore Ratio	Com- pression Ratio	B.M.E.P. lbs. per sq. in.	Piston Speed ft./min.	Weight per B.H.P. lb.	B.H.P. per litre	Weight per litre Capacity lb.
Radial										
815	Leopard	Armstrong-Siddeley	14	1.25	5.0	125	2,120*	2.03	16.8	34.1
515	Jupiter IX	Bristol	9	1.3	5.3	117	2,500*	1.75	17.9	31.4
500	18 AB.	Salmson	18	1.44	5.2	96	2,000	1.98	12.5	24.8
480	Jaguar	Armstrong-Siddeley	14	1.1	5.0	125	1,830*	1.85	19.3	35.7
465	Jupiter VI F.M.	Bristol	9	1.3	5.3	124	2,120	1.61	16.1	26.0
290	Neptune I.	"	7	1.13	5.0	115	1,840	2.1	15.0	31.5
250	9 Ea	Farman	9	1.04	—	116	2,040*	2.14	22.3	47.7
250	—	Renault	9	1.2	—	115	1,670	2.38	15.1	36.0
240	Castor	Walter	7	1.26	6.0	105	1,950	2.29	14.1	32.3
240	7 Mb.	Lorraine	7	1.11	5.0	126	1,800	2.56	15.9	40.7
230	9 AB.	Salmson	9	1.36	5.0	93	1,890	2.54	12.3	31.2
218	Lynx	Armstrong-Siddeley	7	1.1	5.0	120	1,750	2.32	17.6	40.8
205	Titan II.	Bristol	5	1.13	5.0	113	1,840	2.44	14.9	36.4
155	Mongoose	Armstrong-Siddeley	5	1.1	5.0	123	1,700	2.35	17.5	41.1
145	Mars I.	Walter	9	1.14	5.15	115	1,370	2.41	15.4	37.1
120	9 AC.	Salmson	9	1.3	5.0	94	1,535	3.13	13.1	41.0
110	5 Mb.	Lorraine	5	1.12	5.0	100	1,510	3.02	13.5	40.8
110	Venus I.	Walter	7	1.14	5.15	113	1,330	2.66	15.1	40.2
103	Genet Major	Armstrong-Siddeley	5	1.06	5.2	115	1,650	2.42	19.7	47.7
95	7 AC.	Salmson	7	1.3	5.0	97	1,535	3.03	13.3	40.2
90	—	Fuscaldo	7	1.33	—	87.8	2,040	3.3	16.8	55.4
85	A 50	Fiat	7	1.2	—	103	1,255	3.24	12.9	41.8
85	Vega I.	Walter	5	1.14	5.15	121	1,370	2.67	16.5	44.1
82	Genet	Armstrong-Siddeley	5	1.0	5.25	117	1,470	2.56	19.9	51.0
60	Series I.	Pobjoy	7	1.2	5.7	105	1,710*	1.92	24.4	46.8
60	5 AC.	Salmson	5	1.3	5.0	85	1,535	4.03	11.8	47.6
40	9 AD.	"	9	1.22	5.6	87	1,130	3.85	13.4	51.7
In-line										
275	Airsix	A.D.C.	6	1.39	5.0	121	2,190	2.25	16.4	36.8
105	Hermes	Cirrus	4	1.23	5.1	126	1,750	2.95	18.4	54.4
90	Cirrus III	"	4	1.19	5.1	124	1,620	3.17	18.2	57.7
90	Gipsy	De Havilland	4	1.12	5.0	118	1,600	3.17	17.2	54.5
87	S.53	Colombo	4	1.23	5.0	116	1,560	2.62	15.2	39.8
75	AS.8	Argus	4	1.17	5.3	113	1,240	3.3	11.8	39.0
70	—	Renault	4	1.22	—	92	1,560	4.56	12.0	54.8
Horizontal Opposed										
75	Hornet	A.B.C.	4	1.19	5.5	130	1500	3.0	18.7	56.0
35	Scorpion	A.B.C.	2	.89	6.0	132	1380	3.12	23.3	73.0
20	F.7502	Mércedes-Benz	2	1.33	—	98	1970*	5.25	22.6	118.0
Axial										
85	—	Redrup	7	1.37	5.0	110	1,560	2.06	17.0	35.0
40	29 B.	Statax	7	1.78	5.3	123	1,300	2.75	17.1	47.1
Vee										
420	Asso-Caccia	Isotta-Fraschini	12	1.12	5.4	117	2,065	1.65	20.4	33.8

\* Reduction gear fitted.

"square" engine and 1.44 (Salmson 500 h.p.), the majority being between 1.1 and 1.3. Comparing these ratios with those obtaining in car engine design, namely, 1.4 for large engines to 1.7 for small engines, it will be seen how considerable is the break away when the engine designer is unhampered by the artificial conditions imposed by taxation rating formulae. It is, of course, incorrect to assume that because of the removal of these influences from aero engine design the choice of the stroke/bore ratio is left unaffected by other conflicting factors. In the case of the radial engine for instance, it would seem reasonable to expect the ratio to be kept low in the interests of reducing the overall diameter, and yet we find that it is a radial, the 18-cyl. Salmson, which with one exception (the "Statax") has the highest ratio! The large number of cylinders of comparatively small bore accounts for this peculiarity. Table 1 also shows that the stroke/bore ratios of the other classes of air-cooled engines do not differ to any material extent from those of the radials and are certainly not higher than the average for the latter. Thus it may be concluded that cylinder weight has been the deciding factor in fixing this ratio and that 1.2 affords the best compromise among the conflicting factors which govern its choice.

The next interesting comparison in Table 1 is provided by the columns giving the mean piston speeds and brake mean effective pressures corresponding to the normal output and revolutions per minute. Again there is a surprise, for the engine having the largest bore (with one exception), and presumably almost the heaviest pistons, has the highest speed of any, namely, 2,500 ft. per minute on the geared "Jupiter IX F." At the other end of the scale is the little 9-cyl. 40 h.p. Salmson radial which has a mean piston speed of 1,130 ft. per minute. It may be observed in passing that the mean piston speed of the geared "Jaguar" is lower than that of many of the direct-drive engines.

The brake mean effective pressures are practically all between 115 and 125 lb. per sq. in., with the exception of the Salmson radials, which are consistently low, ranging from 96 lb. per sq. in. in the largest engine to 85 and 87.5 in their 60 and 40 h.p. engines respectively. It should be noted that in some cases the piston speeds and not the brake mean effective pressures increase with compression ratio when engines of similar output, but having different compression ratios, are compared.

The weight/power ratio column shows that for powers between 90 and 300 b.h.p. the ratio lies between 2 and 3 lb.

# THE AIRCRAFT ENGINEER

per b.h.p., the in-line engines comparing favourably with the radials. Among the high-powered engines the Jupiters show up particularly well. The only air-cooled V-type engine in the Show, the 12-cylinder 450-b.h.p. Isotta-Fraschini, also has a very low ratio, being second only to the Jupiter VIF. Among the engines of under 90 b.h.p. the little Pobjoy has the extraordinary low ratio of 1.92 lb. per b.h.p., accounted for by its high crankshaft speed.

The column headed "B.H.P. per litre" provides many interesting comparisons. It may not at first be obvious that this ratio is directly proportional to the product of brake mean effective pressure and crankshaft speed, but the proof of this is too simple to justify its occupying valuable space, and it may be taken for granted. Since the mean effective pressure provides an indication of the magnitude of the forces acting within the engine, and the rubbing velocities of the bearings, loads on valve gear, etc., are proportional to the crankshaft speeds, the products of these two factors, expressed as output per litre, gives an indication as to the extent to which the engine is "pressed" when developing its normal output. It does not mean that an engine having a high output per litre is necessarily unreliable, for the high value of the ratio may result from careful and scientific design, but other things being equal, an engine having a high ratio would probably have a shorter life and would require more frequent attention than one having a lower power/capacity ratio. There is one striking feature which makes itself evident when studying this column of Table I, and it is that practically all the foreign engines have a considerably lower ratio than the British engines of similar output. This is a curious fact, though whether it is due to a comparative lack of knowledge or distrust of materials, the use of inferior materials, or merely a matter of design policy, it is impossible to say. The notable exceptions to this rule are the 450 h.p. Isotta-Fraschini and the nine-cylinder Farman radial, the latter having an unusually high ratio, due to the high crankshaft speed permitted by its 0.5:1 reduction gear. From this rough guide it would appear that the A.B.C. Scorpion the little Mercedes-Benz flat twin, and the Pobjoy are the most "hard-pressed" of the engines under consideration. As, however, the ratio is high in the case of nearly all geared engines, it may be concluded that airscrew speeds and not bearing rubbing velocities provide the limiting factor.

The last column shows the ratio of weight to cubic capacity, and was included in the hope that it might indicate the most suitable arrangement, number and size of cylinders to be employed for a given output. There are, however, so many conflicting factors with which the designer may juggle that the weight per litre values do not attain much significance, except that they tend generally to decrease with increase in power, although this tendency is not so marked as might be expected. The differences in this ratio which exist between the British four-cylinder-in-line engines and their foreign rivals is interesting, the lower weight/capacity ratios of the Italian and German engines being due to their larger piston area and lower crankshaft speeds. Among the British engines the radial arrangement seems to have a slight advantage over the in-line grouping if this ratio may be taken as a guide. A comparison of some of the constructional features of the air-cooled engines will next be considered.

**Cylinder Design.**—With the exception of the Fuscald (Italian) all the air-cooled engines have cylinders of composite construction, having separate, and in some cases detachable, heads or radiating surfaces. "Poultice" heads are employed on the two engines which are the sole representatives of their respective classes, the 12-cylinder V-type Isotta-Fraschini and the Airsix, although the methods of cooling the head differ widely in these two cases. In the Isotta-Fraschini the heads are bolted to a common aluminium casting forming the camshaft and valve gear casing, this being held in close contact with the heads, the cooling being effected partially by the oil circulating in the casing, whereas in the Airsix the cylinders are fitted with separate aluminium heads and the camshaft casing is carried well clear of these on studs, which are screwed into the steel portions of the

cylinders, thus allowing an adequate cooling draught to reach the tops of the heads.

Duralumin heads were to be found on some of the smaller engines, whilst the A.B.C. engines were unique in having cast-iron heads. Cast iron is used for the Cirrus and De Havilland cylinder barrels, but they form the exceptions, steel barrels being fitted in all other engines. Two unusual forms of cylinder construction are provided by the Fiat radial and all the Salmson engines. In the latter case the whole of the radiating surface was provided by a finned aluminium shell which encased the steel barrel and head, the sparking plug sockets, valve seats and rocker bracket sockets being of steel welded to the cylinder proper. In spite of the closest examination and searching enquiries the actual method of cylinder construction employed by this firm remains a mystery. The cylinder arrangement and construction on their 18-cylinder engine was most unusual. The Fiat cylinder construction comprises a finned barrel and head casting, the latter having integral lower half valve gear covers and supports, the whole casting being shrunk over a steel liner. The cylinders of the Walter engines are unusual in that the heads may be detached without removing the complete cylinder. It was of interest to observe that this firm had recently changed from the cast-iron head to the aluminium type. The two axial engines, the Redrup and Statax, employed steel liners in a single aluminium body casting, although in the case of the Statax the liners were not fixed but acted as sleeve valves. The various forms of cylinder construction are divided in the following proportions:—

Aluminium head and steel barrel ...	52.5 per cent.
"    radiating surface and steel barrel ...	22.5
"    head and cast-iron barrel ...	7.5
"    " poultice " head and steel barrel ...	5.0
Cast-iron head and steel barrel ...	5.0
Duralumin head and steel barrel ...	5.0
Other constructions ...	2.5

(To be continued.)

## THE DEVELOPMENT OF SPARKING PLUGS FOR AIRCRAFT ENGINES.

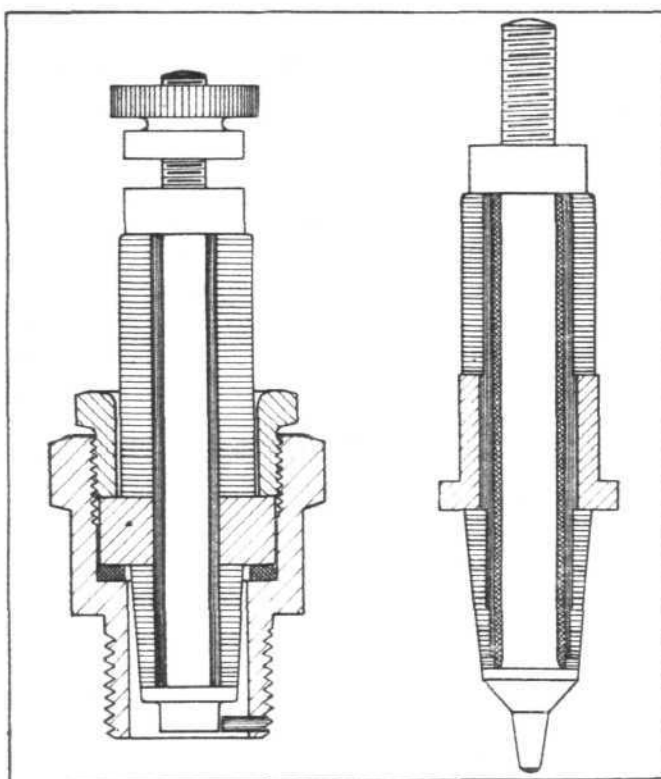
### The Lodge A20, A30 and A40.

There are many different designs to which sparking plugs can be made, but it is interesting to note that the design which has proved generally most successful for aircraft engines, and which is approved by the British Air Ministry, is similar to the very earliest type of mica insulated sparking plugs. Briefly, the design consists of a central electrode wrapped with sheet mica, and then having mica washers threaded over the wrapping. The central electrode is formed with a head at one end, and with a nut at the other end, and the mica washers are clamped firmly between the head and the nut. This insulated electrode, or centre as it is called, is fixed into the metal body of the plug by means of a screwed gland nut, the latter bearing on a shoulder formed out of the mica washers, or by a metal washer supported between the mica washers. This construction makes the plug conveniently dismountable for inspection and cleaning; Fig. 1 illustrates such a plug.

This design is probably the best mechanically, but with the increased efficiency of engines, it has suffered from certain defects. In order to make the plug gas-tight, the mica washers must be clamped under very great pressure, and the great tension which the centre pin has to withstand necessitates its being made of steel, including the head at the sparking end, which is exposed to the flame of the explosions. This steel head was found to burn and scale under the heat. Another trouble arising from the great heat was the difference in expansion of the steel centre pin and the mica washers, which allowed gas to leak through the plug.

In Lodge aero plugs, these troubles are overcome by using a non-sealing alloy of steel which has great tensile strength

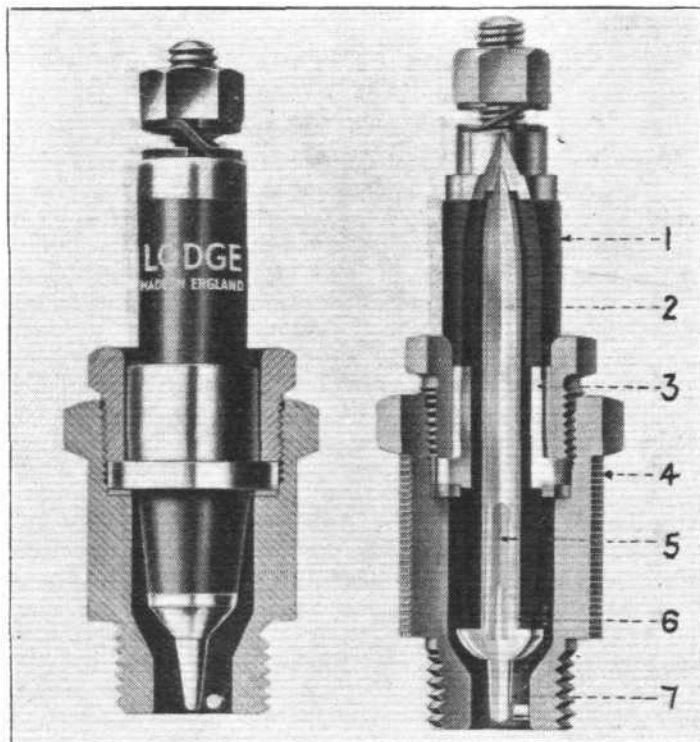
# THE AIRCRAFT ENGINEER



On left, Fig. 1. On the right, Fig. 3, a Lodge type A.30 plug.

and the permanent gastightness of the plug is ensured by shrinking the steel collar (in the middle of the insulated centre) under great pressure directly on to the mica wrapping. In this way, a gastight seal is formed, which is not affected by any variations due to expansion and contraction. This construction is shown in Fig. 2, and is classified as the *Lodge A20 plug*.

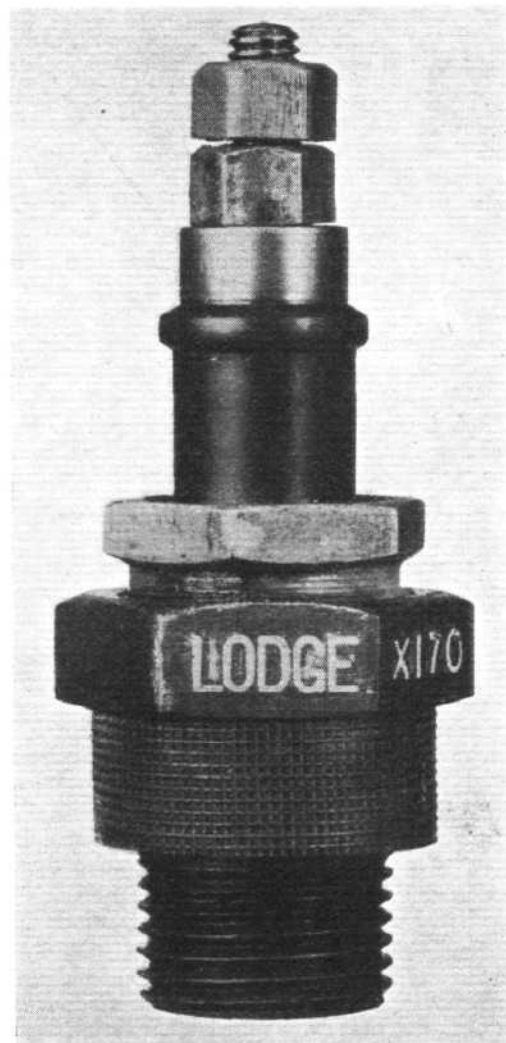
This A20 plug is found to be quite suitable for aircraft engines of medium compression, but when used in high com-



On the left, Fig. 2, Lodge type A.20 plug, showing compressed steel collar which ensures permanent gas tightness. On the right, the Lodge type A.40 (Fig. 4) showing heat-conducting copper core inserted into centre pin, as well as patented heat-conducting copper sleeve. In this illustration, 1 is the mica insulation, 2 high-tensile steel, 3 compressed steel bush, 4 zinc-coated steel, 5 heat-conducting copper core, 6 heat-conducting copper sleeve, and 7 non-scaling durable point.

pression engines at full load, it is liable to overheat, and so cause pre-ignition. To make a plug of this design suitable for high-compression engines, it was necessary to find a method of improving the heat factor of the sparking plug, and this without detracting from its ability to withstand oil and soot. Any design of sparking plug can be made to withstand greater heat by simply reducing the internal air spaces of the plug, but this plan reduces its oil-resisting qualities.

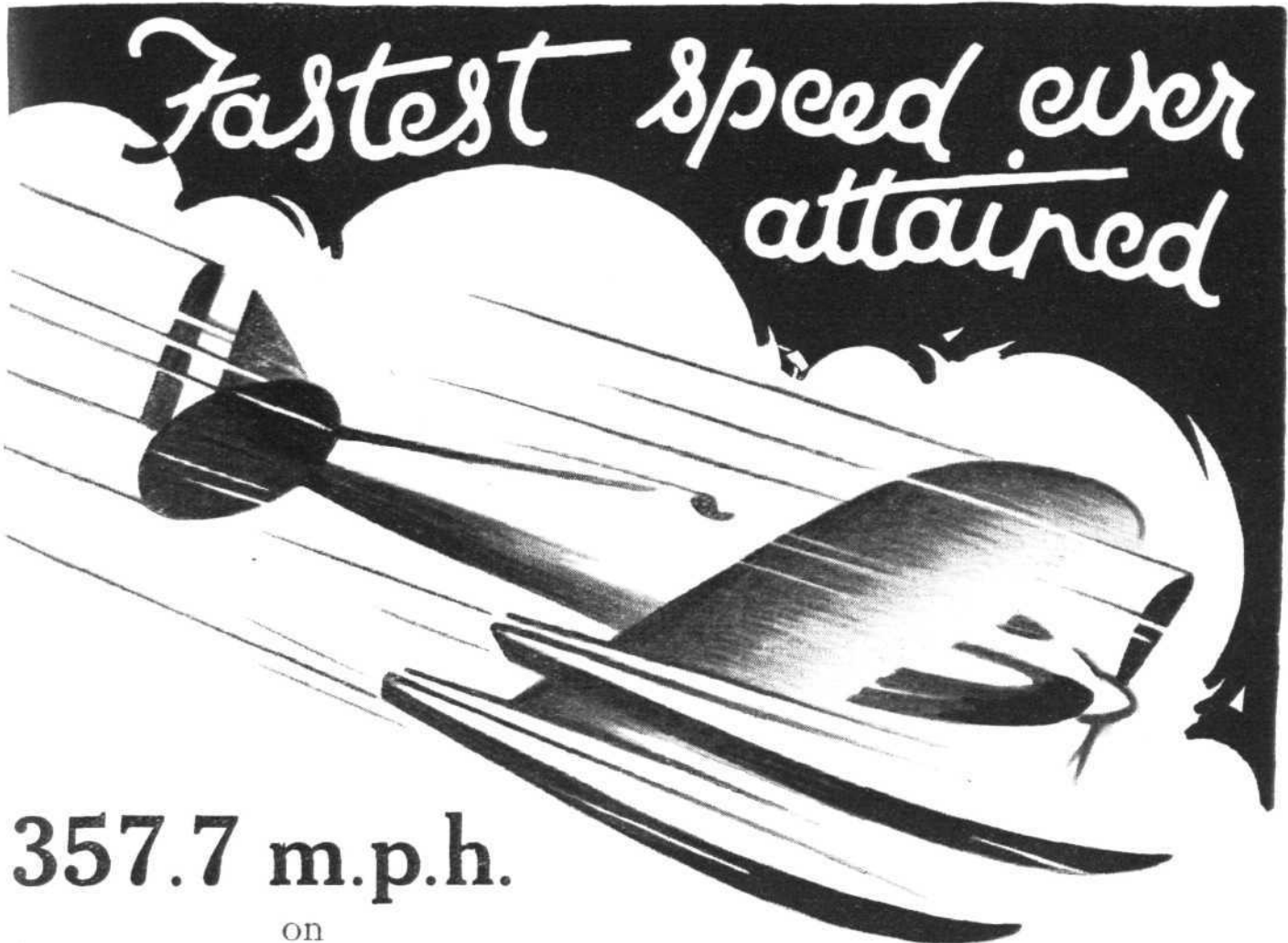
When a sparking plug is fitted into a cylinder, the inside part of the plug which is exposed to the flame acts as a heat receiver, while the part of the sparking plug outside the cylinder acts as a heat radiator. The inside part of the plug may be assumed to reach the mean temperature of the



Lodge Plugs, type X170, were fitted in the Rolls-Royce engine of the Supermarine S.6, which won the Schneider Trophy Contest. The length is but 2½".

combustion chamber less by the rate heat is transferred from the inside of the plug to the air outside. To improve the heat qualities of a plug without reducing its oil-resisting properties, it is necessary to increase the heat conduction through the plug. The obvious way to do this is by the use of copper, but the difficulty is to introduce a sufficient amount of copper without materially reducing the insulation or the strength of the steel centre pin.

A number of different methods were tried, among others that of fitting a thin copper sleeve between the centre pin and the mica insulation, and this method was found to make a surprising improvement. The reason for the improvement is, first of all, that the high-conductivity copper used is roughly 30 times as good a heat conductor as the steel alloy used for the centre pin. Another reason is that in sparking plugs like the Lodge A20, it is probable that it is the mica insulation, and not the central sparking point which first of all gets hot enough to cause self-ignition, and the important improvement produced by the copper sleeve is probably due to its effect in keeping the mica insulation cool.



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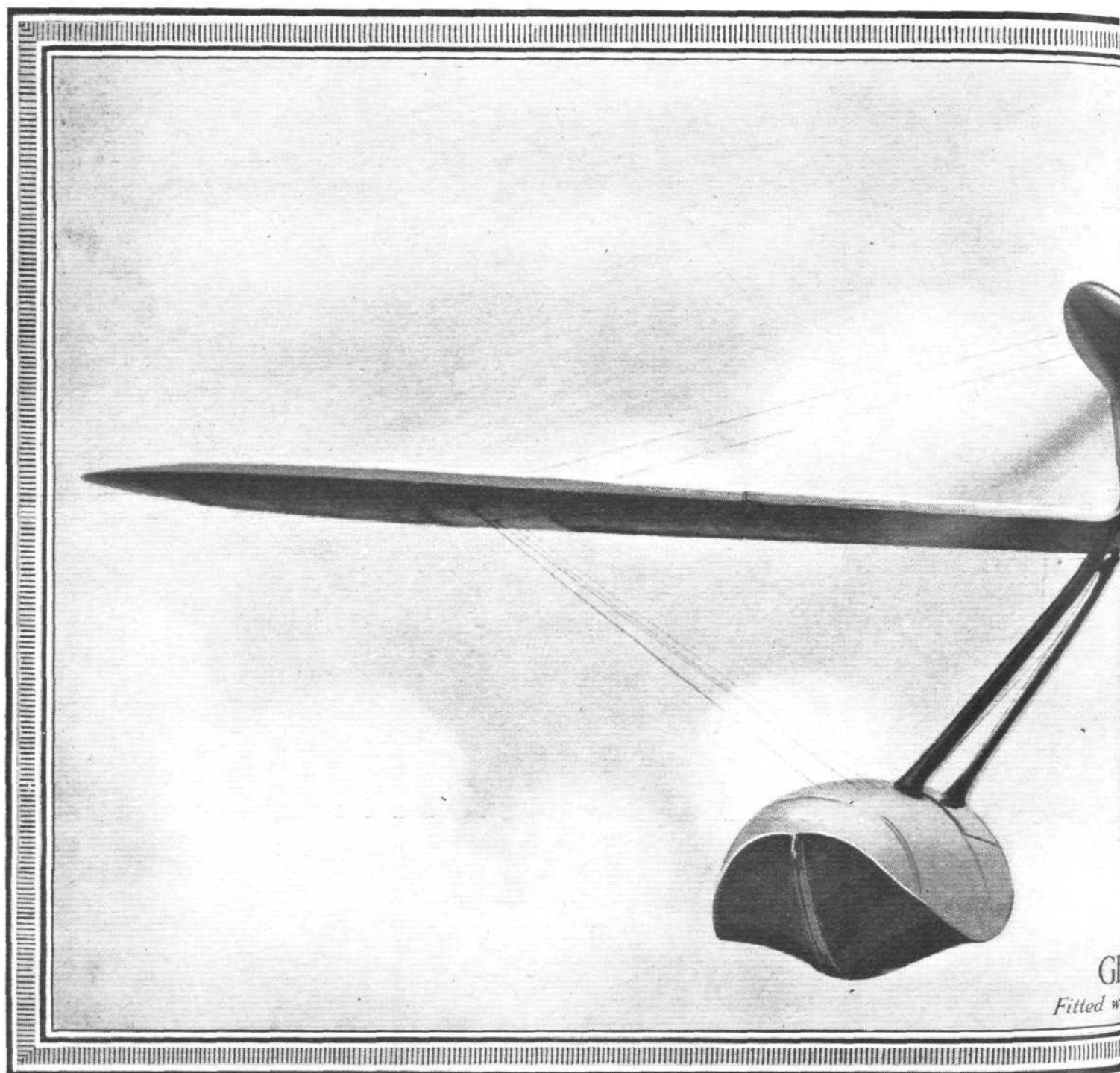
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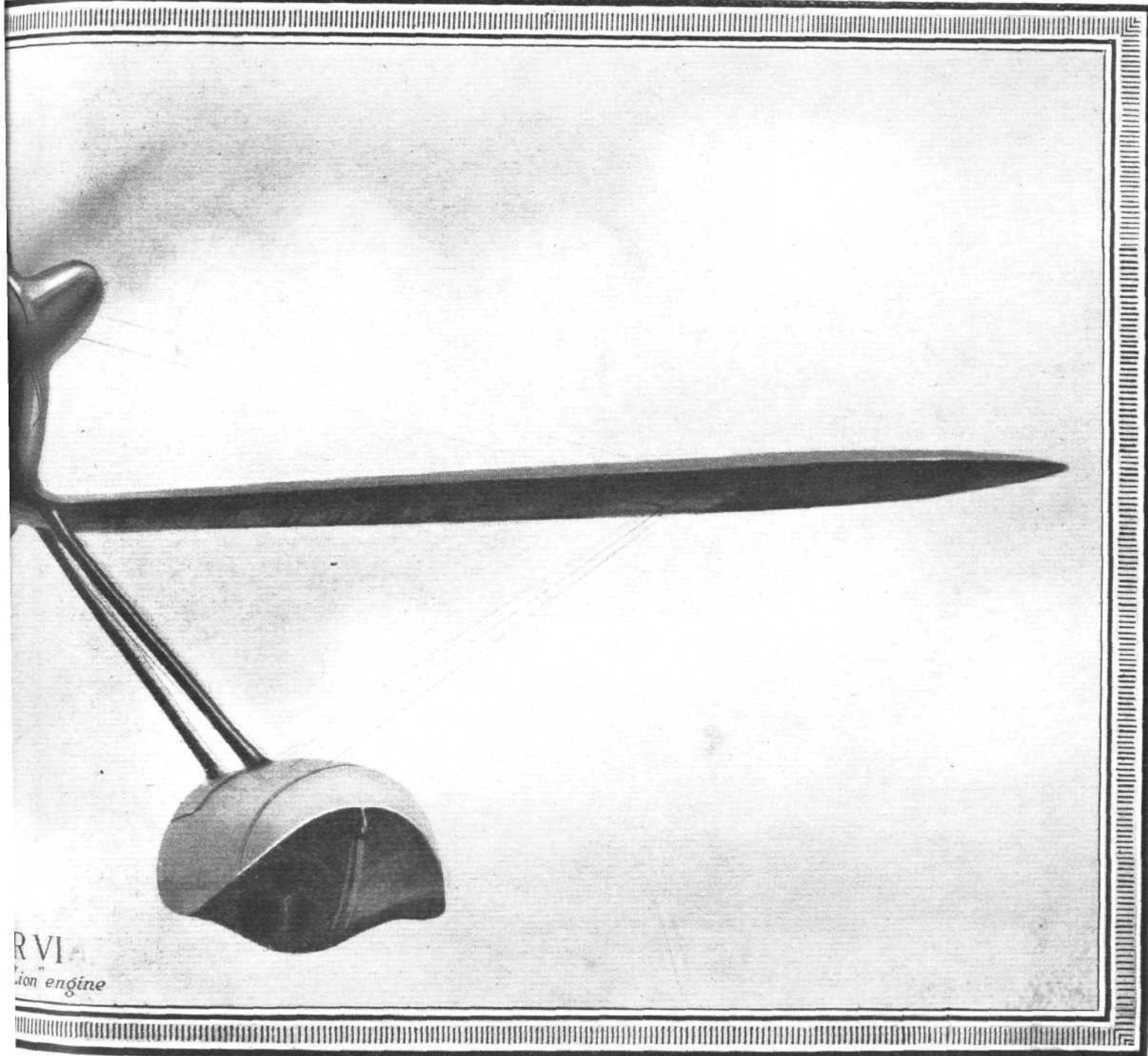
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# THE AIRCRAFT ENGINEER

The construction of such an insulated centre, which is shown in section in Fig. 3, is patented, and the sparking plug made to this design is classified as *Lodge A30*. Such plugs have proved suitable for practically all modern high-compression aircraft engines.

With certain engines of exceptionally high output, such as the Rolls-Royce "F" type, it was found that even the *Lodge A30* was not quite capable of withstanding the great heat at full load tests, and it was necessary to make the plug capable of withstanding still greater heat. This was effected by inserting a short copper core into the centre pin at the sparking end. This method of construction adds considerably to the cost of making the plug, but the combined effect of the copper core and copper sleeve is to render the plug exceptionally good in withstanding very great heat, while still having good qualities in withstanding soot and oil. The construction of such a plug is illustrated in section in Fig. 4, and the design is classified as the *Lodge A40*.

Although the *A30* and *A40* plugs have a little greater internal insulating surface than the *A20*, yet they lose a little in soot-resisting qualities, owing to the centres keeping cooler. Taking the figure 10 as representing both the oil and heat factors of the *A20*, then the comparative figures for the three plugs are as follows:—

		Oil.	Heat.
A20	...	10	10
A30	...	9	15
A40	...	8	17

## SOME NOTES ON OIL PURIFICATION AS APPLIED TO AERO ENGINES (UNDER SERVICE CONDITIONS).

By GILBERT MANLEY.

In view of the present tendency to use mineral oils for lubricating high duty aero engines (*e.g.*, Air Ministry P.4 Specification) any means for dealing with oxidised matter and other impurities may be of interest.

All mineral oils under working conditions, produce a black insoluble compound as the result of oxidation; this compound is generally designated as carbon (although this name is not a strictly accurate title).

Oil is present in the crankcase of an engine in a finely divided state, "fog." This oil "fog" is in contact with the heated engine parts, piston, etc., and oxidises very readily, the degree of oxidation being proportionate to the amount of air present, the fineness of the sub-division of the particles and the degree of heating, also to some considerable extent it is influenced by the chemical composition of the oil and the proportion of unsaturated compounds present. The paraffin series of oils would seem less liable to oxidation than other types.

It may be positively stated that no mineral oil is immune from oxidation, and all oils form this carbon which mixes with the main volume of oil in circulation. This latter oxidises at a slower rate and produces carbon more or less in accordance with the oxidation number as determined by laboratory tests.

Oil that is thrown up on to the cylinder walls and drawn past the piston rings is "burnt" by the heat of combustion. This is a process of destructive distillation and produces a harder type of carbon or coke varying in its characteristics in accordance with the basic composition of the oil.

There are also present in the oil, various abrasive substances which may find their way in via the oil filter, or breather orifices, viz., white metal particles from the bearing. Water which is a product of combustion and may enter in the same way or by condensation, traces of sulphur, FeO, from wear of cylinders and heavy fractions of fuel which dilute the mixture, all these substances will pass readily through the mesh of the finest gauze filters.

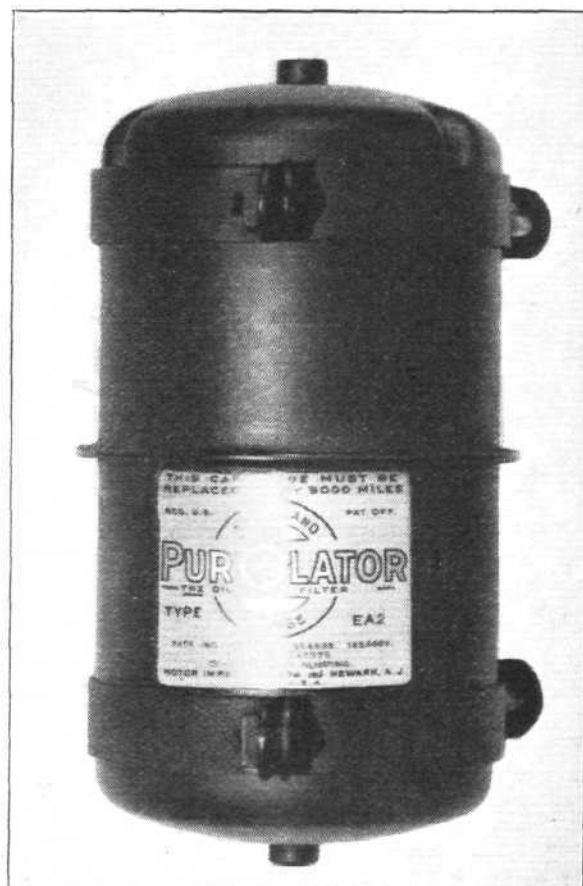
It has been observed that dilution does not as a rule exceed 2 to 3 per cent., and in such proportions this dilution can be safely ignored. It is proposed to show a few of the troubles that can be caused by this foreign matter.

A filter or a centrifuge of good design is capable of dealing

with these impurities and enables the great advantages of a mineral oil to be fully realised. It is not proposed to discuss the relative merits of these devices in these notes.

(1) *Formation of Sludge*.—The presence of a small amount of water, 2 to 3 per cent., is sufficient to cause the suspended carbon to form an emulsion with it, and produce a viscous slime (sludge). This sludge will very readily choke filters and small oil ducts and is particularly troublesome in suction gauges, being the cause of oil starving. (The gear wheel type of pump which is commonly used, has very little "suction" and cavitates very readily), a fine mesh suction gauge aggravates this trouble, a coarse mesh is to be preferred.

It has been observed that bearing "seizure" caused by sludge coating the oil feed pipes and producing a momen-



The "Purolator" Type EA2, the British rights for which are held by Automotive Products, Ltd., of 3, Berners Street, London, W.C.

tary oil shortage, is not generally correctly diagnosed, as the seizure is followed by a rush of oil through the choked passages which clears out the obstructing sludge and obscures the real cause of the trouble.

The cases observed have been on automobile engines which have less detail attention given to them than would be paid to aero motors, but the cumulative results of an oil that sludges badly may be serious on aero engines. A good filter will remove the emulsifying agent and prevent the formation of sludge.

(2) *Centrifuging of Oil in Hollow Crank Pins*.—The angular velocity attained by the crank pins of large engines is considerable, and it has been observed that carbon "centrifuges" out in the interior of these crank pins, which is the very worst place for this to happen.

The crank pin of a normal aero engine is generally heavily loaded, and one of the limiting factors in high speed engine design, is the ability of the circulating lubricating oil to absorb and dissipate the heat generated at this bearing.

This oil passes to the crank pin via the main bearings (where it sustains a preliminary heating). The crank pin itself has no adjacent heat dissipating mass and the oil is relied on to carry away the bulk of the heat generated at this point. The factor of safety is not high and any restriction of oil supply at this point is dangerous.

## THE AIRCRAFT ENGINEER

An efficient filter will reduce the proportion of carbon in suspension in the oil and leave very few particles of sufficient weight to "centrifuge out." If desired a filter bed of sufficient fineness to deal with the very lightest of these particles (colloidal carbon) can be obtained and a "star bright" filtrate produced.

The rate of flow or output of any filter is proportionate to the  $\frac{(\text{density})}{(\text{fineness})}$  of the filter bed, and in practical applications a balance between output and fineness of filtrate is fixed. The carbon and impurities trapped in the filter materially assist in increasing its efficiency, as they are deposited evenly and uniformly on the filtering surfaces and form an additional filtering bed of gradually increasing depth and fineness. It is assumed that the internal construction of the filter is so arranged that this may happen.

The impurities trapped have considerable volume and adequate space for the orderly building up and retention of this filter cake is very important.

The provision of this filter cake space is often sacrificed in order to provide a large nominal filtering area which is non-effective area.

(3) The oil thrown up on to the cylinder walls and drawn into the combustion space has a certain amount of carbon in suspension. This carbon adds a further quota to that which would be produced by the burning of clean oil and the formation of coke on the cylinder head, piston, etc., is accelerated.

This statement has been substantiated as the results of very careful tests made on a series of engines. It was noted that the period between top overhaul (grinding in valves) was considerably lengthened when a filter was connected in the oil circuit.

There would seem to be an impression that filtered oil after use in an engine loses its lubricating properties or (the much discussed word) "oiliness." Recent research work would seem to show that this "oiliness" is of doubtful value, and in fact rather a detrimental quality, as an oil which has this property usually decomposes readily and deposits a sticky asphaltic residue.

The viscosity, oxidising figure, coking value and general characteristic of a filtered or renovated oil are nearly similar to those of the original oil, assuming dilution is not present to any serious extent. In point of fact the oil may be actually more stable. Renovated oil always possesses a characteristic odour and a slightly darkened or burnt colour. The fluorescence or bloom is also absent. These points are unimportant.

The writer has made extensive tests over a period of several years with renovated oils both in practice and in the laboratory and in neither case has trouble been experienced.

The practice of fitting straining slabs of felt in the crank-case is to be deprecated, owing to the danger of fluffy particles of this becoming detached; unless it is of the thick and highly compressed type, the area of this felt is necessarily restricted, observation of the condition of this felt is difficult and changing a somewhat difficult and messy job.

A separate filter has a considerable cooling value, the filtrate is easily checked and renewals are clean and certain, the filtrate is greatly superior both in volume and clarity and the effective life very much greater.

**Oil Temperature.**—Space does not allow more than a brief reference to this problem. Oil temperature (temperature of bulk of oil in circulation) on aero engines shows temperature often exceeding 70° C. It may be assumed that all bearings other than the piston operate in a condition of "flooded" lubrication and have a definite film of oil interposed between the rubbing surfaces. The thickness of this film is more or less directly proportionate to the viscosity of the oil, the viscosity being directly proportional to the oil temperature. There is generally no difficulty in maintaining an unbroken oil film of reasonable thickness in the main and camshaft bearings as these bearings are subjected to even loading and have considerable adjacent heat conducting surfaces. As regards the big end, a different position is apparent. The bearing loading is intermittent, being a combination of inertia, fluid and centrifugal forces, and there are no adjacent heat dissipating surfaces. It may happen that the oil film at this

point becomes very thin and even actual rupture occurs (momentarily). Any finely divided abrasive matter in suspension in the oil bridges this thin film and scoring and heating occur. Any abrasive matter in the oil is objectionable and should be removed by filtration.

### THE ADDISON-LUARD CALCULATOR

#### A New Air Navigation Instrument

A new and interesting instrument, the Addison-Luard Course and Wind Calculator, has recently been developed and patented by Mr. H. Addison, B.Sc., A.M.I.C.E., and Lieut. W. B. Luard, R.N. (retired). Its purpose is to simplify air pilotage and navigation by furnishing the pilot, in the shortest time and in the most easily understood form, with precise information concerning the effect of the wind on the course and speed of his machine. If the wind is already known, the instrument shows almost automatically the relationship between course steered, air speed, track, ground speed, etc., while if the wind is unknown the instrument enables its speed and direction to be quickly calculated from the results of drift or similar observations. Although various other devices can be used for the same purposes, it

is claimed that the Addison-Luard instrument has important specific advantages, which will be detailed later; but first it is proposed to explain the novel geometrical construction which underlies all forms of the Addison-Luard calculator.

In its simplest form the object of the instrument is, in effect, to provide a mechanical equivalent for the ordinary wind-velocity triangle, Fig. 1. We have to deal with three directions: course, track, and wind direction; and with three speeds: air speed, ground

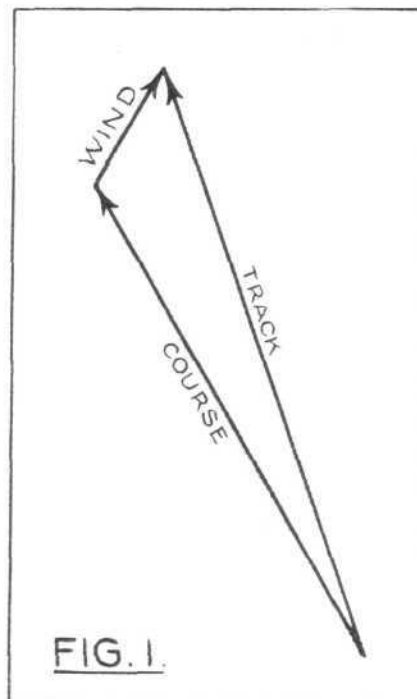


FIG. 1.

speed, and wind speed; and the ideal instrument will be one in which the three directions can be represented by three arms radiating from a common centre, the three speeds being shown by cursors or sliders mounted on the respective arms. But it is further necessary to link together the cursors in some positive but

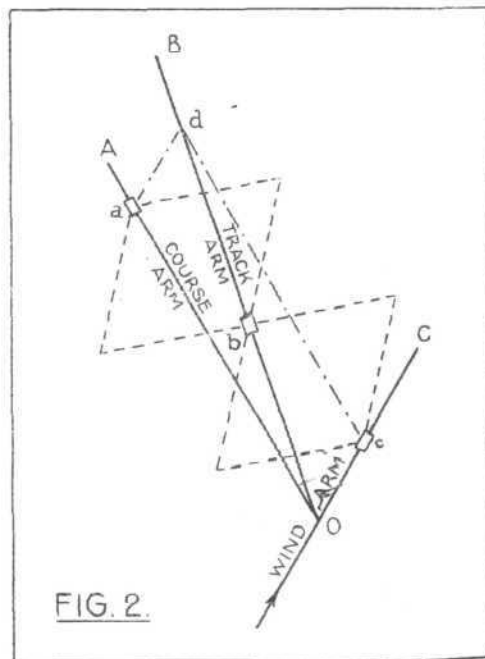
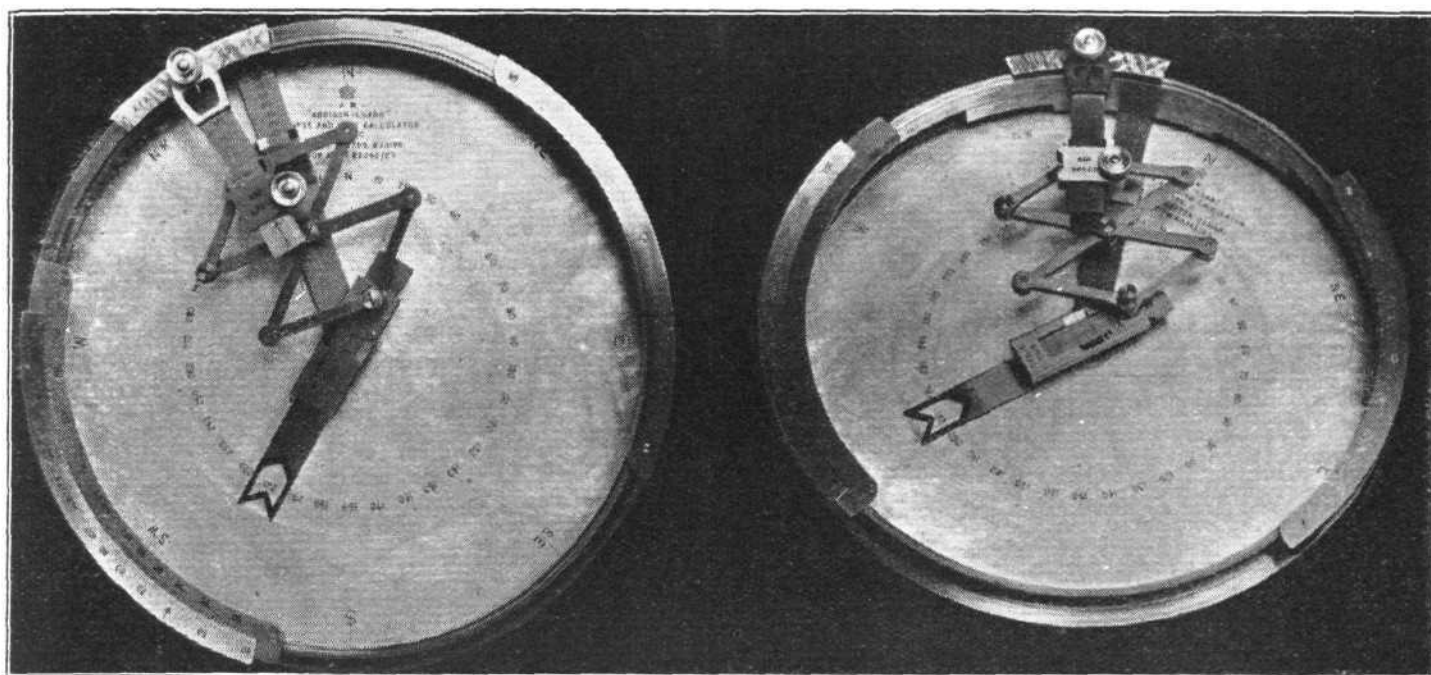


FIG. 2.

# THE AIRCRAFT ENGINEER



Left, Fig. 3, and right, Fig. 4, The Addison-Luard Course Calculator, Type "B"

simple fashion in order that the correct geometrical relationship between directions and speeds shall always be maintained. Mr. Addison and Lieut. Luard evolved quite a pretty solution to this problem by using a pantagraph for linking the cursors together. Fig. 2 shows diagrammatically the resulting apparatus, set to correspond with the velocity triangle, Fig. 1. OA, OB, and OC are the three arms representing course, track, and wind direction respectively, while *a*, *b*, and *c* are the cursors representing air speed, ground speed and wind speed, the pivots of the cursors being interlinked by a pantagraph. In the parallelogram *Oadc*, wind speed can be represented either by *ad* or by *Oc*. Moreover, it is one of the properties of a pantagraph that the centre pivot *b* is midway between *a* and *c*; but also *b* is midway between *O* and *d*; therefore, if the graduations on arm B are laid out to half the scale of those on arms A and C, it becomes possible to read directly, from the positions of the cursors on the arms, all the three speeds involved.

Fig. 3 represents the Addison-Luard calculator, type "B," as actually constructed. The air-course arm is seen projecting radially inwards from a saddle sliding round the rim of the circular base; this arm is graduated in units of air speed, and on it slides the air-speed cursor. The track and wind arms are pivoted at the centre of the base. The pantagraph interconnecting the three cursors is clearly visible.

An example will show the ease of operation of the calculator. Suppose it is desired to find track and ground speed, having given that air course is  $330^\circ$ , air speed is 100 m.p.h., wind direction is  $210^\circ$ , and wind speed is 25 m.p.h. The solution is as follows:—

Set air course arm to  $330^\circ$ ,  
air speed cursor to 100,  
wind arm to  $210^\circ$ ,  
wind speed cursor to 25 m.p.h.

These operations have automatically brought the track arm and ground speed cursor to their correct positions, so that it is possible to read off at once, without further manipulation, the required values, viz.:—

Track:  $340^\circ$ .  
Ground speed: 114 m.p.h.

Figs. 3 and 4 show the settings required for this example, while the corresponding velocity triangle is shown in Fig. 1. When the calculator is turned so that the air course arm points fore and aft towards the nose of the aircraft, as in Fig. 4, the pilot can see in the clearest manner the relation of wind, track, etc., to himself as he sits in the machine; in the present example, for instance, a glance shows that the machine has starboard drift under the influence of a wind

on the port quarter (Fig. 4 also shows the degree graduations inside the rim of the base, with respect to which the course and track arms are set). By turning the instrument so that the north point lies directly ahead, as in Fig. 3, the pilot can now see how course, track, wind, etc., are related to his maps or charts.

Any problem similar to the one described can be worked out on the calculator; for instance, to find course to steer to make good a desired track, and corresponding ground speed, the wind being known, or to find wind direction and speed from a knowledge of course, track, and speed. All such problems involve the solution of *one* velocity triangle, but by a slight modification the calculator can be arranged to solve *two* interlinked triangles. The particular practical use for which the instrument is then adapted is the calculation of wind direction and speed, and thence ground speed, by the "wind star" or "double drift" method.

(To be concluded.)

## TECHNICAL LITERATURE

### SUMMARIES OF AERONAUTICAL RESEARCH COMMITTEE REPORTS

These Reports are published by His Majesty's Stationery Office, London, and may be purchased directly from H.M. Stationery Office at the following addresses: Adastral House, Kingsway, W.C.2; 28, Abingdon Street, London, S.W.1; York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; or 120, George Street, Edinburgh; or through any bookseller.

THE BEHAVIOUR OF A SINGLE CRYSTAL OF ZINC SUBJECTED TO ALTERNATING TORSIONAL STRESSES. By H. J. Gough, M.B.E., D.Sc., Ph.D., and H. L. Cox, B.A. Work performed for the Engineering Research Board of the Department of Scientific and Industrial Research. R. & M. No. 1183. (M. 57.) (32 pages and 9 diagrams.) July, 1928. Price 1s. 9d. net.

A lengthy research on the properties of single metallic crystals under alternating and other stress systems has been in progress at the National Physical Laboratory since 1923. The behaviour of aluminium crystals has received considerable attention and, at the request of the Elasticity and Fatigue Sub-Committee, the programme was extended to include typical metals crystallising in widely different space lattices. A paper on the deformation of  $\alpha$ -iron, as an example of the body-centred lattice, has already been presented. The present report deals with an experiment on a single crystal of zinc, as representing the hexagonal (close-packed) lattice. Arrangements have been made for carrying out similar tests on single crystals of antimony (rhombohedral lattice) on which further reports will be made.

## THE AIRCRAFT ENGINEER

Attention has been directed to the changes in micro-structure and the method of failure produced by alternating torsional couples, and the experimental results have been considered in relation to the structure of the crystal and with regard to the imposed stressing system. Mechanical, microscopical and X-ray methods have been used and the results of all these methods of investigation have been correlated.

The results of the present experiment may be briefly summarised as follows:—

1. The slip plane of zinc is the basal plane (0001).
2. Three possible slip directions exist, namely, the three primitive directions contained by the basal plane.
3. Deformation of a zinc single crystal is controlled purely by resolved shear stress considerations and occurs along the most highly stressed primitive direction contained by the basal plane.
4. The "visible slip limit" (probably of the present specimen only) was clearly defined at a range of resolved shear stress of  $\pm 1$  ton per sq. in., while the limiting range (fatigue range) of reversed shear stresses, in the case of the present crystal has a value intermediate between  $\pm 1.0$  and  $\pm 1.3$  tons per sq. in. in terms of resolved shear stress.
5. The twinning plane of zinc has been identified as first order pyramidal (two)—1012 type—producing a twinned basal plane, making an angle of  $94^\circ 5'$  with the original basal plane. The twinned structure has been identified by means of accurate measurements of slip bands on the twinned basal planes. Twinning is undoubtedly a secondary result of basal plane slip and the particular twinning planes (of the six available sets) operative appear to be principally determined by the direction of slip on the basal plane and probably by normal stress consideration.
6. Fracture resulted in three general directions:—(a) parallel to the traces of the original basal plane, (b) parallel to the traces of the twinned basal plane within the twinned structure, and (c) along the edges of the twins.
7. Prismatic planes are neither slip nor cleavage planes, and it appears very probable that what have previously (by other investigators) been interpreted as cleavages of this type, have been cleavages or fractures along twinned basal planes.

## THE AGE-HARDENING OF SOME ALUMINIUM ALLOYS.—

By Marie L. V. Gayler, D.Sc., and G. D. Preston, B.A. Presented by Dr. W. Rosenhain. Work performed for the Engineering Research Board of the Department of Scientific and Industrial Research. R. & M. No. 1220. (M. 60.) (33 pages and 22 diagrams.) October, 1928. Price 2s. net.

The following physical properties of five typical aluminium alloys containing copper, magnesium silicide, or both, have been examined under similar conditions of heat-treatment, so that further light may be thrown on the mechanism of age-hardening. (1) Brinell hardness; (2) tensile strength; (3) density; (4) electrical conductivity; (5) changes in the crystals, as determined by X-ray analysis.

It is shown that the changes in density and in lattice parameter which take place during ageing, suggest that precipitation from solid solution takes place. X-ray analysis shows also that the crystals themselves are in a disturbed state, which is gradually relieved by further ageing at high temperatures. The increase in electrical resistance on ageing corresponds to this distortion of the space lattice of the solid solution, caused by the presence of minute particles due to the decomposition of the solid solution.

It has been inferred that the precipitation from solid solution entails two processes—(1) The rejection of the atoms of the dissolved metal from the lattice of the solid solution accompanied by the possible formation of molecules; (2) a "coagulation" of these rejected atoms or molecules takes place, a process which follows closely upon the first and probably largely overlaps it.

The evidence given may be regarded as strong confirmation of the theory that hardening is due to the precipitation of highly-dispersed particles.

THE CHARACTERISTICS OF A TAPERED AND TWISTED WING WITH SWEEP-BACK. By H. Glauert, M.A., and S. B. Gates, M.A. Presented by the Director of Scientific Research, Air Ministry. R. & M. No. 1226 (Ae. 381). (19 pages and 4 diagrams.) December, 1928. Price 1s. net.

The wing of a monoplane is frequently tapered in plan form from the centre section towards the wing tips, and the taper is commonly accompanied by a variation in aerofoil section which implies that the wing has a certain aerodynamic twist along its span. Another mode of departure from the conventional aeroplane design of rectangular wings and tailplane is represented by the tailless aeroplane, whose wing tips are swept back relative to the centre section.

The analysis is developed to determine first the lift, drag and pitching moment of any swept-back wing with uniform decrease of chord and incidence along the span, and is then extended to determine the stability derivatives  $M_w$  and  $M_q$ . Some aspects of the analysis are also extended to the more general case of any type of twist.

The two main conclusions which can be drawn from the analysis are:—

- (1) To obtain a stationary centre of pressure it is necessary to use a combination of twist and sweep-back, and the angles required are not modified appreciably by tapering the wing.
- (2) A tailless aeroplane with a swept-back wing, with any given degree of static stability, has relatively poor damping compared with that obtained from a conventional aeroplane.

FULL SCALE CONTROL TESTS ON FOKKER F. VII 3M MONOPLANE. By J. K. Hardy, B.A. Presented by the Director of Scientific Research, Air Ministry. R. & M. No. 1228. (Ae. 383.) (8 pages and 22 diagrams.) November, 1928. Price 9d. net.

Since 1925, when M. Fokker demonstrated the flying qualities of the Fokker F.VII monoplane at Croydon, this aeroplane has been reputed to possess an unusual degree of control in stalled flight. This quality has been made the subject of a critical investigation, both by full scale and model experiments.

Measurements of lift and drag formed the subject of the early full-scale experiments,\* and these, together with handling trials at large incidences quickly discovered that the control, when flying at stalling incidences, was in no way abnormal. This has been confirmed by the measurements of the response of the aeroplane to simple control movements that form the subject of this report.

\* R. & M. 1096. Full-scale measurements of lift and drag of the Fokker F.VII monoplane.—J. K. Hardy.

A series of records has been taken, showing the motion of the aeroplane following the application of the rudder or the ailerons, in both stalled and normal flight. Records of the behaviour of the aeroplane, when both the rudder and aileron controls are held central in stalled flight, are also included.

The lateral control of the Fokker is very similar to that of other aeroplanes. The direct rolling moment of the ailerons steadily decreases with increasing incidence to such a degree that, in some of the manoeuvres at stalling incidence, the aeroplane rolls against the ailerons from the start. Sideslip is seen to be very important in limiting the rate of roll. The rudder control is very similar, both in stalled and unstalled flight: there does not seem to be any falling off in rudder power as the incidence is increased.

These tests show that the Fokker cannot be considered to possess any unusual degree of control in stalled flight. In normal flight, the controls are well matched and sufficiently effective.

Similar experiments are being made on an Avro 504 N, and a Bristol Fighter fitted with slots and flaps.

LOADS ON THE MAIN PLANES AND TAIL OF AN AEROPLANE WHEN RECOVERING FROM A DIVE. By H. Bolas, B.Sc., A.M.I.C.E., and G. A. Allward of Messrs. Geo. Parnall & Co. Communicated by the Director of Scientific Research, Air Ministry. R. & M. No. 1229. (Ae. 384.) (24 pages and 7 diagrams.) August, 1928. Price 1s. net.

The object of the investigation was to examine the loads produced upon the wings and tail plane of an aeroplane when pulled out of a dive, with a view to determining if a satisfactory means can be suggested of preventing structural failure under extreme conditions.

A step-by-step method of calculation was adopted in order to render mathematical treatment practicable. Variations were made in gear ratio between elevator and control stick, in the total time to pull back, in maximum hand load, and in initial diving speed.

In R. & M. No. 282,\* some experiments are described which indicate that in bad conditions, a force of 150 lb. can be applied in one-fifth of a second, and that furthermore, the time of application need not vary appreciably with the distance through which the stick is pulled. This is a somewhat surprising result which, however, has been lately confirmed by the writers using an apparatus constructed especially for the purpose. The figures quoted were therefore adopted as covering the worst conditions.

The calculations indicate that the maximum loading on both wings and tail is produced very rapidly. In the case of the tail, the load quickly reaches a maximum, and then falls away eventually becoming reversed.

Variable gear control does not produce immunity from failure unless the gear ratio is very low, in which case, large hand loads cannot be applied. The time of application of the hand load is of much less importance than is the load itself.

Conclusions.—(1) It is thought that danger of failure through rough handling can only be avoided by limiting the control load, which can be transmitted to the elevators.

The means provided might reasonably take the form of a control stick having a hinge at some convenient point—a spring being introduced which would ensure a virtually rigid stick for normal purposes, but which would allow the stick to "break" when the pull back exceeded a certain pre-assigned load.

(2) Although beyond the scope of the present notes, it is interesting to speculate that the rapid application and probably equally rapid diminution of wing and tail loads, may result in stresses being developed which vary appreciably from those calculated, on the assumption that the loading is of a gradually-applied nature.

\* A.R.C. Report 1916/7. Vol. II, p. 479. Experiments on the possible rate at which a pilot can pull back the control column of an aeroplane.

PRESSURE PLOTTING A STREAMLINE BODY WITH TRACTOR AIRSCREW RUNNING. By C. N. H. Lock, M.A., and F. C. Johansen, B.Sc., A.M.I.Mech.E. R. & M. No. 1230. (Ae. 385) (22 pages and 9 diagrams.) January, 1929. Price 1s. net.

Measurements of pressure distribution have been made over the whole surface of a streamline body with tractor airscrew running, viz., the blunt-nosed body of R. & M. 1030,\* with the screw in the forward position (0.25 D shielded). Observations were taken at six working conditions, starting from zero airscrew thrust.

Pressure distribution over the body was also measured with the airscrew removed, and found to be in sensible agreement with the distribution at zero airscrew thrust. With increasing thrust the pressure just in front of the airscrew diminished slightly, just behind the airscrew it increased considerably, giving a considerable resultant pressure drag on the whole nose, only slightly smaller than the value predicted by the theory of R. & M. 1120.† Near the maximum ordinate, the negative pressure increased with the thrust roughly as the square of the slipstream velocity; at the extreme tail, the positive pressure at zero thrust changed to a negative pressure at large thrust.

In a separate experiment, the thrust of the airscrew and spinner, and the drag of the remainder of the body were measured on two separate roof balances, together with the torque. The results are, on the whole, in agreement with corresponding results of R. & M. 1030.

At zero thrust, the skin friction drag provides the largest proportion of the total drag; at a large thrust, the pressure on the nose, suction on the tail and skin friction provide roughly one-half, one-quarter and one-quarter respectively of the total drag. The results are in agreement with the conclusion that the interference of the body produces no sensible change in the "effective efficiency" derived from an "effective thrust" equal to the airscrew thrust minus the resultant pressure on the nose. The remaining body drag at large thrust is roughly double the value that would be predicted from the increase of slipstream velocity; the skin friction increases only a little more rapidly than the square of the slipstream velocity, while the suction on the tail is almost entirely a spoiling effect.

The experiments have been repeated with the screw in the rear position of R. & M. 1030, and a report of these is now in preparation. It is further proposed to make experiments on a small scale model (8 in. diameter) of the body to obtain the correction for tunnel interference in the absence of the airscrew.

\* R. & M. 1030.—Experiments with a family of airscrews, including effect of tractor and pusher bodies. Part IV. On the effect of placing an airscrew in various positions within the nose of a streamline body.—Bateman, Townend and Kirkup.

† R. & M. 1120. Analysis of experiments on an airscrew in various positions within the nose of a tractor body.—Lock.

## Schneider Trophy



## Great British Triumph



On September 7th 1929, Flying-Officer Waghorn flying a Supermarine Rolls-Royce S6 Seaplane over a 350-kilometre course, averaged 328.63 miles per hour, thus retaining the Schneider Trophy for Great Britain.

On September 10th 1929, Squadron - Leader Orlebar, A.F.C., also flying a Supermarine Rolls-Royce Seaplane reached the astounding speed of 368 miles per hour over the 3-kilometre speed course. This is the fastest speed ever attained by any aircraft of any nation.

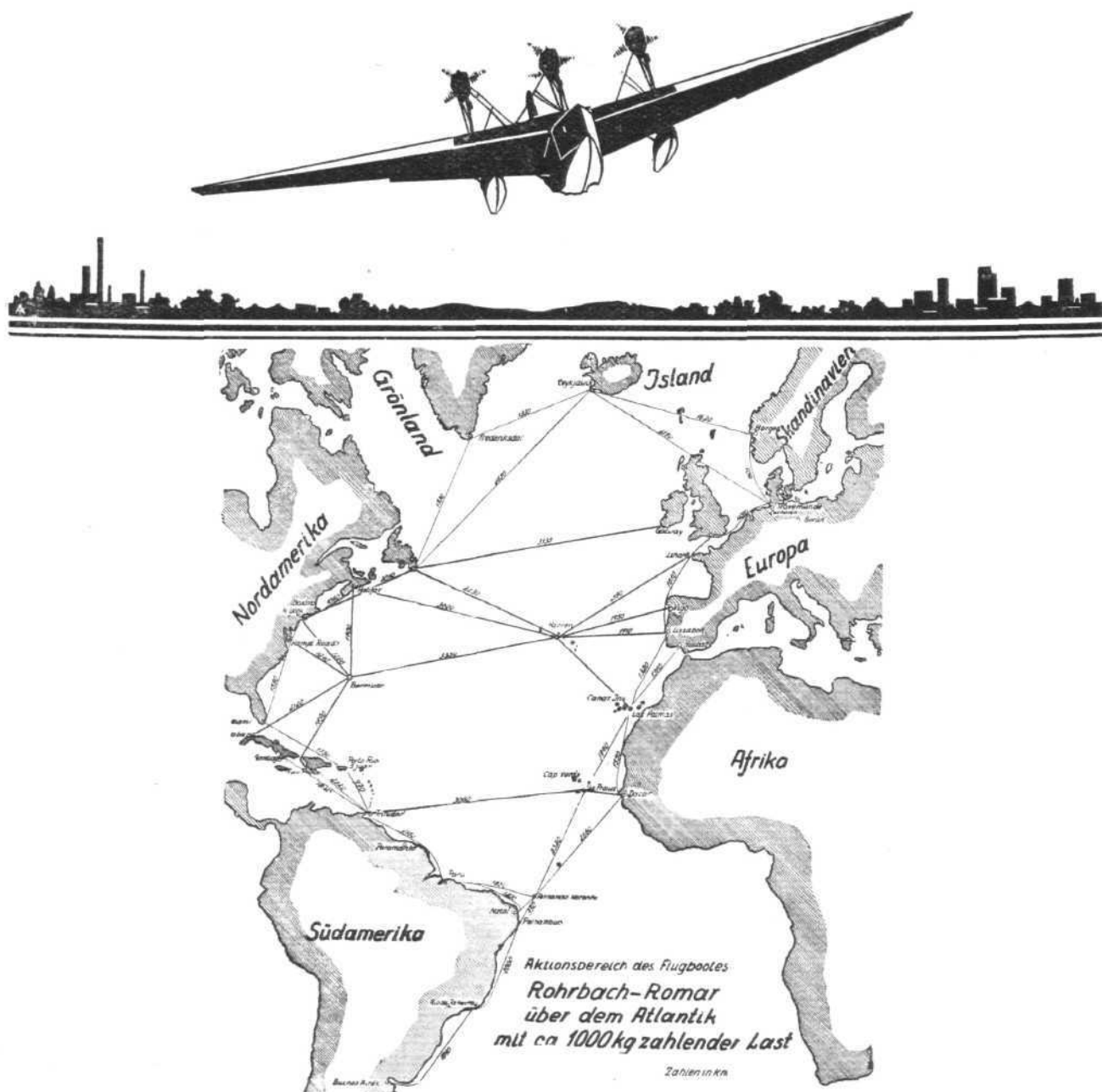
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### Col. Lindbergh's Tour

On September 18, Col. and Mrs. Lindbergh left New York on an aerial tour of the West Indies and Central America, over the route of Pan-American Airways, via Miami, Havana, Porto Rico and Dutch Guiana. The return journey will be made by the coast of Venezuela and Colombia, thence to Panama and Central America. During his tour he will open an extension of the mail and passenger route from San Juan, Porto Rico to Paramaribo, and will study the question of including passengers on the Canal Zone-Miami air mail route. Col. Lindbergh will fly a 3-engined Fokker over the first portion of the route (to San Juan), and a Sikorsky amphibian over the remainder.

### Land of the Soviets

THE Soviet aeroplane "Land of the Soviets," which is making a second attempt to fly from Moscow to New York, arrived at Nikolaievsk on September 12, after having been delayed a week at Khabarovsk. On September 18, after a stormy passage, it reached Petropavlovsk, and continuing on September 20, it arrived the following day at Attu Island, having covered 745 miles at an average speed of 117 m.p.h., mainly in stormy weather.

### The Binesco Cup

COMMANDANT BURDULOIU and Captain Jacobesco have won the Binesco Cup for the fastest time between Paris and Bucharest by making the flight in 9 hrs. 25 mins., beating the previous record by 1 hr. 5 mins.

### Increased Swedish Air Traffic

THE passenger, goods and mail traffic on the Swedish air lines this year has shown a great increase, according to the latest reports published in Stockholm. The number of passengers using the Stockholm-Berlin and Malmoe-Amsterdam lines has risen considerably since the preceding year, but the Stockholm-Helsingfors passenger traffic this season shows an increase of no less than 67 per cent. over

1928. At the Bulltofta airport near Malmoe, which is the most important aerial centre for the continental traffic, the number of in- and out-going passengers during the first eight months of this year was 3,869. The number of arrivals and departures of machines during the same period was 1,693, and the total quantity of in- and out-going goods and mail about 160,000 km. Short flying trips at the Stockholm and Malmoe stations covered a distance of 17,000 km., while sightseeing flights above Stockholm attracted 1,177 passengers against only 690 in 1928. Several ambulance flights to out-of-the-way places in the Stockholm Archipelago have been successfully performed, bringing patients in a critical condition into the Stockholm hospitals.

### U.S. Airship Services

A DEMONSTRATION of how easily airships and trains can work together in speeding travellers to their destination, was made recently at San Bernardino, California, U.S.A., by the airship "Volunteer," of the Goodyear Tyre and Rubber Company. This airship is now being operated by the California offices of the Goodyear Company. The airship came down alongside a waiting train, took on three passengers as quickly as they stepped from the train, and then took off from the station yard and flew on to Los Angeles, California. The passengers landed at the Goodyear offices in Los Angeles in much faster time than could have possibly been made had they continued their journey by rail. The "Volunteer" is one of five airships built and being operated in the United States by the Goodyear Company. The others are the "Pilgrim," "Puritan" and "Vigilant," operating out of Akron, Ohio, U.S.A. (used for student training purposes, and for frequent passenger service), and the "Mayflower," which is now quartered at New Bedford, Massachusetts, U.S.A., where it will remain several months, assisting the Massachusetts Institute of Technology in radio, navigation and fog research.



THE ZENITH CUP WINNER: The De Havilland "Gipsy-Moth" on which recently Capt. Broad won the Zenith Cup Circuit of France in a day, at an average speed of about 112 m.p.h., is actually the machine flown by Broad in this year's King's Cup race. The cowling arrangements are a little unusual, and are designed to reduce air resistance. ("FLIGHT" Photos.)

#### Catapult Air Mail

AN aeroplane with mails left the *Bremen* off the Isle of Borkum on the morning of September 19, and, after a landing at Amsterdam, arrived at Cologne by mid-day.

#### Lone Trip to India

MR. H. R. LAW left Lympe Aerodrome on Tuesday in his Moth to visit his uncle, Sir Frederick Sykes, the Governor of Bombay.

#### Aero Fete at Vichy Aerodrome

AN aerodrome built by the efforts of the Aero Club and Municipality of Vichy was opened on Sunday, September 15. The French aces Doret, Lemoigne, Haegelen, Melle Maryse Bastie, etc., took part in the grand display given on this occasion. M. Laurent-Eynac, Minister for Air, was represented by M. Chaumie, Director of Commercial Aviation.

#### Regrettable Accidents

ARTHUR BRUNNING was killed and S. M. Annis seriously injured when the machine they were flying crashed near Welling (Kent) railway station. From a statement made by Annis it would appear that Brunning had a fit or a heart attack and fell over the control-column, and before Annis could regain control of the machine it had gone into a spin and crashed.

Edward Tiarks of Axbridge and Edward Somerset of the Coldstream Guards were killed as the result of a crash at Hambrook, near Bristol. Both carried "A" licences and the cause of the accident has not been ascertained.

#### Under-Secretary's European Air Tour

MR. MONTAGUE, M.P., Under-Secretary for Air, is making a tour of Europe by air for the purpose of comparing the systems abroad with those in this country. He will be accompanied by the Deputy-Director of Civil Aviation, Mr. F. Bertram, and will travel as an ordinary passenger without any special arrangements being made.

His programme was to leave Croydon on Tuesday by K.L.M. for Rotterdam, and then via Amsterdam to Hamburg, Copenhagen and Malmo; returning by Dresden, Berlin, Vienna, Munich, Nuremberg, Frankfurt, Cologne, Brussels and Ostend.

#### Aero Club de France Balloon Mystery

A BALLOON, with the basket blood-stained and carrying the Aero Club de France colours has been found near Kamenice in Yugoslavia. It has been established that the pilot was a M. Noguer, who left St. Cloud last Saturday, but his fate is not known.

## A LIGHT AIRSHIP—THE A.D. 1

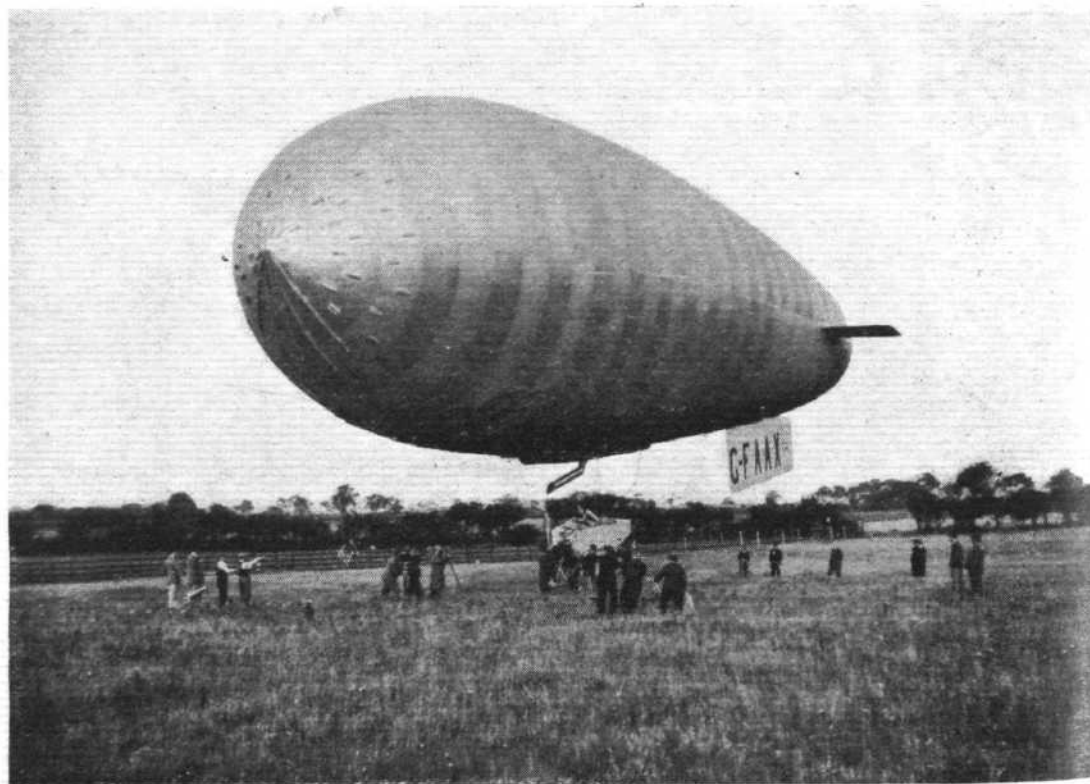
THE A.D. 1, which has been built by the Airship Development Co., is the first attempt to produce a small airship suitable for training purposes or for the private owner.

It is based on the war-time "Zero" type ship and, except that she is a tractor and the suspension of the car has been modified to give greater safety, she remains substantially the same as those well-known "Blimps." The capacity is nominally 60,000 cub. ft., and trials have shown that she has a pay-lift (over and above the crew) of 700 lbs. With the A.B.C. "Hornet" engine she has

flown as a free balloon to a suitable landing ground or, if the breakdown is of a minor nature, the engine can be repaired in the air and the flight resumed.

The company are laying down a second ship at their works at Cramlington Aerodrome, and it is their intention to start a training scheme for those who wish to take their airship pilot's "ticket." There are a large number of men still in the country who had secured their balloon "tickets" at the end of the war, but who were unable to carry on and get to the airship stage, and enquiries from such as these are being received by the company in large numbers.

The A.D. 1 during her Lift Trials: The nose stiffening of the ship, it will be seen, was not then complete.



a cruising speed of about 45 m.p.h. and a top speed in still air of about 75 m.p.h.

She has proved entirely up to expectations on her trials and is very easily manoeuvred. The designers intend the type to be suitable for touring, training, and advertising. For this latter purpose panels 76 ft. long by 24 ft. high are attached to each side, and the ship will be flown at slow speed over suitable districts—districts which would be unsafe for an aeroplane owing to the risk of a forced landing, whereas with the A.D. 1 should the engine fail she is simply

Such airships as these should have a very definite appeal to the private owners who can afford what they want and can fly for pleasure as opposed to flying as a means of transport.

With the new type car which is being designed to utilise the full pay-load it should be possible to seat four passengers as well as the crew, which would allow the private owner-pilot to transport his family in comfort, and, as it has been found that the ship is easy to handle on the ground, the owner should not have any difficulty in getting about the country.

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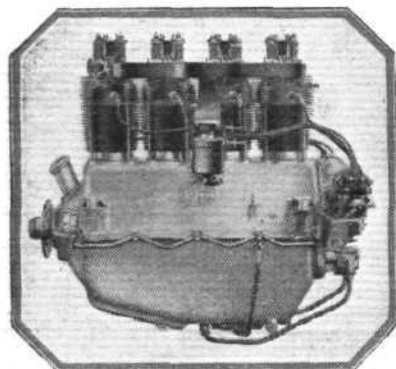
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VICOMTESSE DE SIBOUR,  
during her world tour in  
a slotted "Moth."

"Daily News."  
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## HALDON AIR RALLYE

MR. PARKHOUSE, of the AGRA Engineering Co., had very bad luck with the weather for his Rallye at Haldon last Saturday. Very heavy and gusty winds made it impossible to carry out the programme properly and the spectators had to be content with exhibitions of aerobatics by a few well-known pilots.

Quite a large number of machines arrived and among those who supported the meeting were Sir Sefton Brancker piloted by Mr. T. D. Bruce, in "DCA," Lady Bailey, Capt. H. Broad, Flt.-Lieuts. T. Rose, M. Le P. Trench, and Louis Paget; Flg.-Off. H. J. Penrose; Messrs. A. C. M. Jackaman, F. R. Matthews, A. Wheatley, P. Grey, J. W. Chalener, and A. F. Wallace.

Mr. A. H. Rawson came over in an Autogiro and provided one of the unrehearsed thrills. In spite of the weather, he made a good landing and then unfortunately the wind got under the rotor and turned him over. Mr. Rawson was emptied out, and though he was not much hurt, the machine was badly smashed up.

The Westland IV and a Junkers F.13 added variety to the machines present as, barring the Autogiro, the others were all light aeroplanes, well known even in the "wilds of Devon."

It was particularly bad luck for Mr. Parkhouse to have had his first public meeting spoilt like this when the weather has been so kind at the majority of meetings this year as this is, we believe, about the only Flying School in that part of the country, and Mr. Parkhouse is, so to speak, breaking fresh ground by his work there, but the enthusiasm of the local residents shows that his efforts should bear good fruit in due course, and probably next spring will see him inundated with "would-be" pupils.



Mr. W. R. Parkhouse of the Agra Engineering Co., whose efforts were so badly treated by the weather clerk.  
(*"FLIGHT" Photo.*)



HALDON'S WEATHER! The clouds and the picketed machines show a little of what they had to contend with at Haldon. (*"FLIGHT" Photo.*)

## MAUBOUSSIN RECORDS

World's Records (subject to homologation), established by the French machine, the Mauboussin Light Monoplane, Type 10, fitted with the A.B.C. "Scorpion," Mark II, 35-40 h.p. British engine.

### CLASS "C," CATEGORY IV

Single-Seater Aeroplanes weighing less than 200 kilos  
Speed over 100 km. (62.14 miles)

The French pilot, Fauvel, on September 4, established a world record by a speed of 140 km. an hour (87 m.p.h.) on the circuit Le Bourget-Vaucienne and return (100 km.).

#### Altitude

The same pilot the following day beat the previous record, reaching a height of 5,300 m. (17,388 ft.), starting from Le Bourget at 17.40 and landing at 19.30.

### Distance Non-stop (closed circuit)

The same pilot, on September 6, beat the previous record (held by Hungary) in covering seven times the circuit of 100 km. (Le Bourget-Vaucienne-Le Bourget, thus making 700 km. (435 miles), starting at 10.30 and finishing at 16.50.

### Distance Non-stop in line

The same pilot on September 10 started from St. Inglevert (near Calais) at 12.20 and arrived at Pau (Pyrenees) at 19.40, covering a distance of 850 km. (528 miles) in 7 hrs. 20 mins., at an average speed of 72 m.p.h. for the whole distance.

The fuel consumption on the distance (closed circuit) worked out at 53.4 m.p.g. for petrol and 2,540 m.p.g. for oil.

## CIVIL AVIATION IN CANADA

THE Report on Civil Aviation in Canada for 1928 has just been issued by the Dominion Bureau of Statistics at Ottawa. This report is of particular interest as recording the progress made during the first decade of the post-war flying era in Canada.

The year 1928 has been remarkable in many ways. All phases of aviation activity have developed greatly in Canada and three new important advances have taken place, the first being the inauguration of air mail services in the Dominion and the linking-up of these with air services in the United States; the second being the flying club movement, and the third departure being the construction of the mooring mast and air base at St. Hubert, near Montreal. Airship flights to this structure are expected to take place some time this year from Cardington, the corresponding station in Great Britain.

Apart from these activities of a Governmental character, there has been during the year a general forward movement in commercial aviation, and a remarkable record has been achieved by Canadian pilots operating in Arctic and sub-Arctic regions. Men and supplies have been transported to newly discovered mining camps, and prospecting parties taken into practically inaccessible districts which could not have been opened up under pre-war conditions for very many years. Northern Canada has been so thoroughly organised for flying during the past year that it is not too much to say that no district in the Dominion is now beyond one, or at the most two, days' flying from a railway terminal.

Although the report records a regrettable increase in the number of accidents causing death and injury, it is notable that these accidents took place, not in northern Canada, where they might reasonably have been expected, but in settled districts where modern facilities are available, and

where possibly men are employed who lack the experience of the war-time pilots. In fact, northern work has been free from accident in spite of its danger and difficulty and of the very large mileage which has been covered up to date.

The report intimates that in 1928 there were four firms manufacturing aircraft in Canada and no less than 54 operated air services. The number of aircraft flights made during the 12 months was 75,285, not far short of five times the number in the previous year. The number of aircraft hours flown was 43,071, with a mileage of 2,728,414. The number of pilots carried was 75,285; the number of passengers, 74,669; and the total weight of freight transported was 2,404,682 lb., in addition to 316,631 lb. of mail matter.

The number of air harbours of all types in Canada in 1928 was 44, and there were 264 licensed civil aircraft of all types. Licensed personnel numbered 458, in addition to 85 unlicensed air mechanics.

The summary of civil aviation accidents during the year mentions that the total personnel killed numbered 17 and that 22 were injured. Of the killed, 11 were passengers and a similar number of passengers were injured. The relation of aircraft miles per accident was 151,579 to one; the number of aircraft flights per accident was 4,182.5 to one; and the number of aircraft hours per accident was 2,392.8 to one.

Copies of the report, which gives detailed information relative to the organisations of civil aviation in Canada, air mails, light aeroplane clubs, Provincial Government air services, aeronautical engineering, the Canadian aircraft industry and the St. Hubert airport base, can be obtained on application either to the High Commissioner of Canada in London, The Canadian Building, Trafalgar Square, London, S.W.1, or to the Department of National Defence at Ottawa.

## THE NEWCASTLE AERO CLUB PAGEANT

THE Newcastle Air Pageant, which will be held at Cramlington Aerodrome, on Saturday, October 5, promises to be the most important meeting of the year.

There will be the three main races for the Air League Challenge Cup, the Grosvenor Challenge Cup, and the S.B.A.C. Challenge Cup, which are all handicap races, and also an hour's demonstration by No. 29 Squadron R.A.F., a parachute descent by Mr. Trantum, exhibitions by well-known civil pilots and, weather permitting, a demonstration of the new light airship built by the Airship Development Co.,

whose works are also at Cramlington—and to which reference is made elsewhere in this issue.

The official starting time of the programme is 2 p.m., and the show should be over at 5.30 p.m. All competing aircraft must be at Cramlington Aerodrome by 2 p.m. on Friday afternoon for official verification, and they are warned that the aerodrome is closed to civil aircraft between 2 p.m. and 4 p.m. Shed accommodation will not be available, and competitors must therefore be prepared for their machines to remain in the open, and bring their own picketing gear.

## THE ENTRIES FOR THE RACES

Pilot's Name and Race Entered.		Entrant.		Aircraft.		Engine.		Registration.	
S. B. A. C.	Air League.	Grosvenor Cup.							
A. C. Mills.	P. Michelson	A. Goodfellow	Lancs Ae. C.	Avian IV	Cirrus II	G-AAEC			
(Not Given)	(Not Given)	F. R. Matthews	London Ae. C.	Moth	Gipsy	G-AABN			
	Miss Leathart or	Miss Leathart or	Miss Leathart or	Spartan 3-str.	Cirrus III	G-AACV			
	Mr. Runciman	Mr. Runciman	Mr. Runciman						
	A. C. M. Jackaman	A. C. M. Jackaman	A. C. M. Jackaman	Moth Coupé	Gipsy I	G-AADX			
	Flt.-Lt. Bruce	Flt.-Lt. Bruce	R.A.E. Ae. C.	de H. 53	Cherub III	G-EBXN			
	F/O S. A. Thorn	F/O S. A. Thorn		Avian I	Cirrus II	G-EBQN			
	J. D. Irving	J. D. Irving	J. D. Irving	Moth	Gipsy	G-AADA			
	H. R. Murray-Philipson		H. R. Murray-Philipson	Moth	Cirrus II	G-EBWD			
	H. H. Leech	H. H. Leech	Southern Ae. C.	Martlet	Hornet	G-AAII			
	R. G. Cazalet	R. G. Cazalet	R. G. Cazalet	Widgeon IIIA	Hermes	G-EBRM			
	J. Wellworth	J. Wellworth	Halton Ae. C.	Widgeon III	Genet	G-EBRQ			
	Flt.-Lt. Ashton	Flt.-Lt. Ashton		H. A. C. Minus	Cherub III	G-EBOO			
		A. M. Blake	R. Blackburn	Bluebird 4	Gipsy	G-AABB			
		H. S. Broad	De H. Aircraft Co.	Moth Coupé	Gipsy	G-AAHP			
		R. R. Bentley	R. R. Bentley	Moth	Cirrus III	G-EBSO			
F. J. Addison	Mrs. Hislop	W. B. Ellis	Newcastle Ae. C.	Moth	Cirrus I	G-EBLX			
Dr. H. B. L. Dixon	D. Wilson	G. S. Kemp			" II	G-EBPT			
N. S. Todd	C. Thompson	D. Dixon			" II	G-EBQV			
	Miss W. Brown	Miss Brown	Miss Brown	Avian III	Cirrus II	G-EBVZ			
		Flt.-Lt. L. Poer	Lt.-Col. J. Barrett-Lennard	Avian 594	Hermes	G-AAHJ			
		A. S. Scroggs	A. S. Scroggs	de H. 53	Cherub III	G-EBQR			
		Miss Slade	Miss Slade	Moth	Cirrus II	G-EBSA			
	Lady Bailey	Lady Bailey	Lady Bailey	Moth	Gipsy	G-AAEE			
		A. A. Anderson	Glenny and Henderson	Gadfly	Scorpion II	G-AARJ			

## The Prince of Wales: Golfer and Private Owner

THE Prince of Wales playing in the R.A.F. Officers G.A. championship meeting at Sunningdale last Monday won the nine holes second division handicap with a return of 45-6=39.

The Prince has recently purchased a Gipsy Moth for his own private use. The machine which has the registration letters G-AALG has pneumatic upholstery and is completely

fitted with dual control, each cockpit having a full set of instruments.

Mr. E. H. Fielden has been appointed personal pilot to the Prince; he was seventh in the King's Cup Race when flying a Gloster Grebe for Sqdr.-Ldr. Guest and is in the R.A.F. Reserve. He is the first pilot to be permanently attached to the establishment of a member of the Royal Family.



# CLAUDEL HOBSON

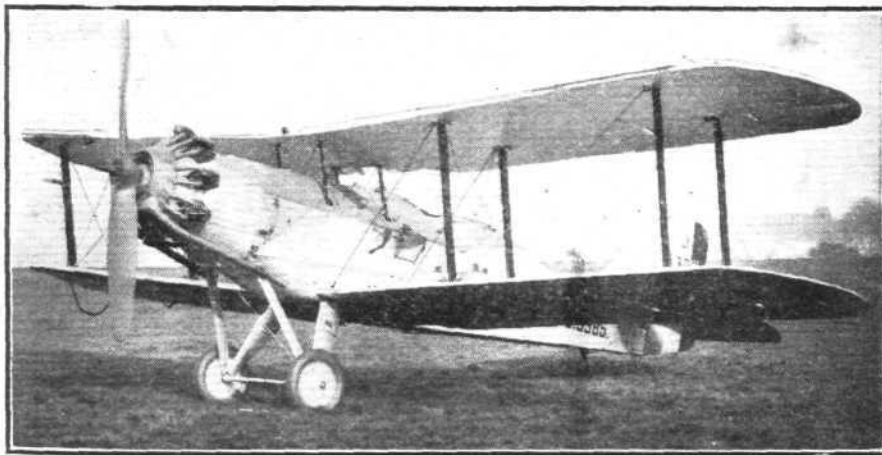
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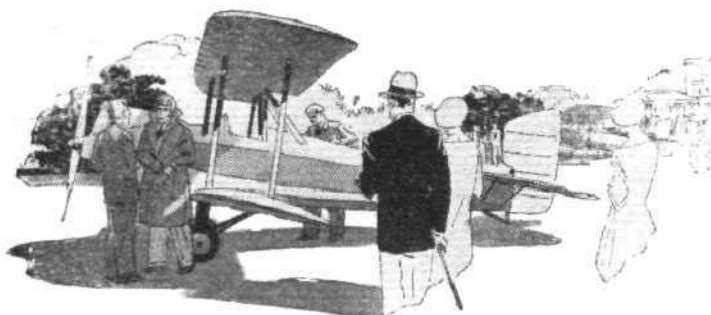
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Experience shows that the average flying member is able to "pass out" after a period of from 13 to 20 hours' training. The minimum under N.F.S. rules is eight hours' "dual" instruction and five hours' "solo" flying, the cost of this minimum course being under £25.

Not only is Hanworth one of the largest air parks in the country, but as a Country Club it is unexcelled. The club itself provides first-class residential accommodation, lounges, dressing and drawing rooms, writing-room, ball-room, and an excellent standard of catering. Tennis and squash racquets courts provide facilities for outdoor recreation. The Hanworth estate covers an area of 230 acres.

A limited number of members are now being enrolled at the following rates: Flying Members, 5 gns. entrance fee and 5 gns. annual subscription; Non-flying Members, 3 gns. in each case. For 1929 two-thirds of the annual subscription is rebated. Serving Officers of H.M. Regular Forces are admitted without entrance fee. Membership of Hanworth Club confers honorary membership of all other N.F.S. clubs and free use of every N.F.S. station. Private flying for qualified members costs as little as £1 1s. an hour (3½d. a mile). Residential terms at Hanworth range from 5½ to 7 guineas per week.

Write to-day for the N.F.S. brochure that fully describes the privileges of membership and enumerates the services offered to all who wish to fly.

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## EDDIES

**H**OW does the following strike you for an original essay by a little maiden of 15 summers—one Kathleen I. Rackett, of Watford:—

### The World in A.D. 2028

I was lying on the sofa, looking into the fire one evening, when the appearance of the room began to change. The room was now made of marble, and was supported by several pillars. I got up and looked around. Where could I be? Suddenly I heard a footstep, and a figure appeared. He was dressed in a short, flimsy garment, which contrasted greatly with his hard and iron-like expression. His appearance rather frightened me, for he seemed to look half-mechanical. Suddenly I realised that he was a "robot," or a man-made human being. He came towards me and handed me a small box. "Your breakfast, madame," he said. I took the box and opened it. Was this all I was allowed for breakfast? It was a small, hard cake, and did not look very appetising. However, as I was hungry I took and ate it. After eating half of this small cake my hunger was quite appeased. I marvelled greatly at this, but did not say a word.

Soon another robot came up to me and said, "Your 'plane-o-car is ready for school." I followed him, and after passing through several large rooms I came out into the open air. Here a car was waiting for me, and I stepped in. The robot then pressed several buttons and the car moved. It travelled at a tremendous pace, and then, to my surprise, rose into the air. I was then able to have a full view of the wonderful city into which I had come. Houses of a tremendous height and with flat roofs were connected with one another by huge bridges. On the roofs of most of the houses small aeroplanes were to be seen.

At last the car-o-plane that I was in sank down, and at last we landed on a very large stone space on the top of a large building. Here I got out, and saw other car-o-planes, aeroplanes, and baby-planes landing. I soon learnt that this was my school. I followed the crowd of queerly dressed boys and girls. They all rushed to a certain part of the roof. We waited there for some time, and then the whole corner sank. I was very frightened at this, but my comrades seemed quite calm and collected. I afterwards learnt that this was a

huge lift. Soon we arrived at the bottom of the building. I spent most of the morning watching lessons which were being taught by television.

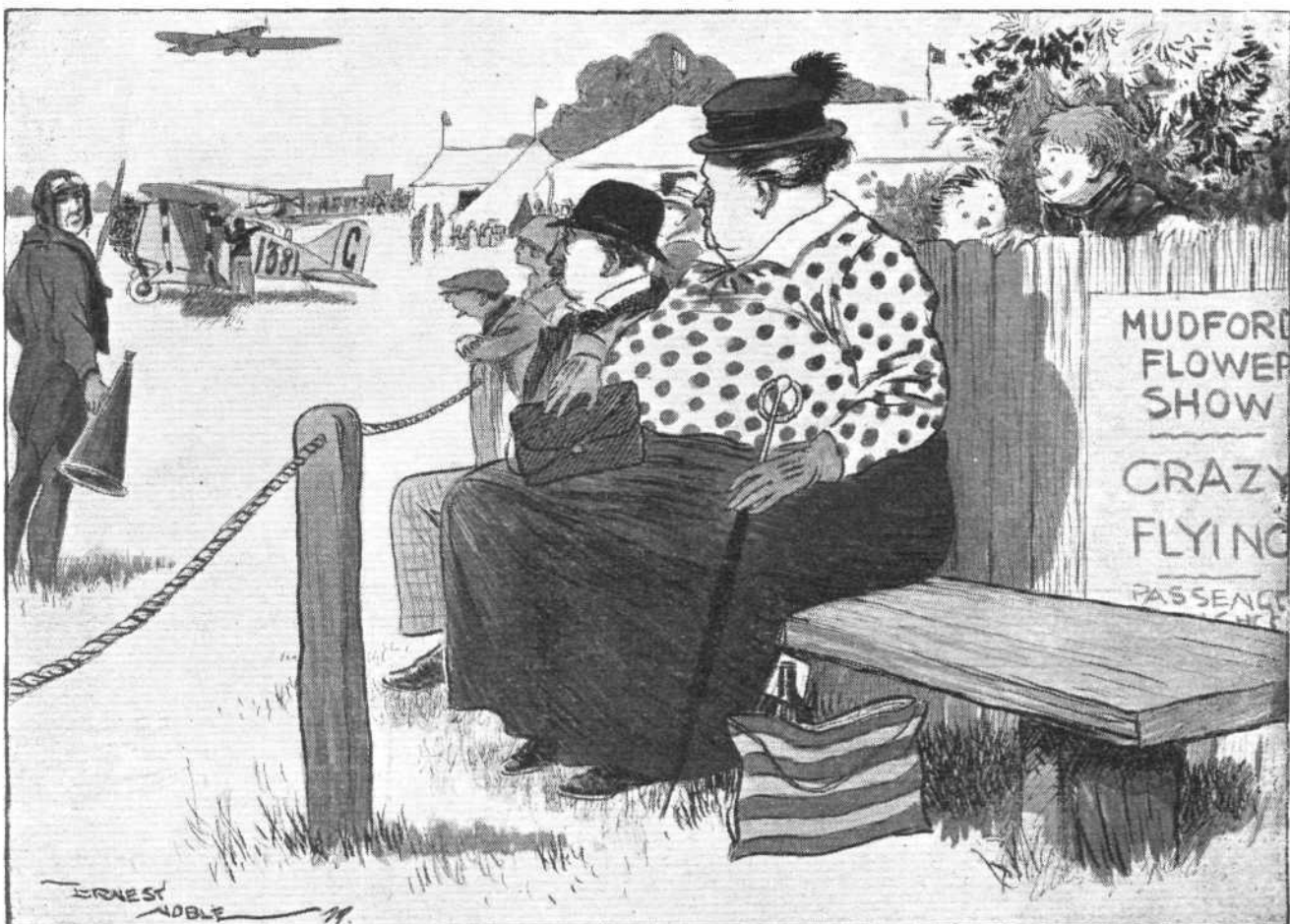
In the afternoon we played a game called ball-o-plane. In this game each player had to sit in her baby-plane. A ball was then thrown from a 'plane above, and each girl had to try and get it. This was great fun, and we rode very speedily. Suddenly the ball came my way. I steadied my machine to catch it, but at that moment another 'plane came from behind. It obtained the ball and also knocked into me. I was not used to such perilous positions, and my 'plane wobbled and then turned completely over. I went flying through the air, and then arrived with a terrible bump to the earth. I then opened my eyes, and saw that I was lying on the floor in my own house. It was only a dream.

**L**ITTLE Miss Rackett's school-marms at Bartlett Schools may well be proud of their promising pupil, not forgetting her respected parent, Mr. P. E. Rackett, a director of Aeroplane Automatic Devices Co., Ltd.

**W**HEN I saw the other day "Aeroplane Smuggling in Uruguay" as a heading to a news paragraph in one of our leading dailies, it set me wondering what sort of a man (and what type of expanding suit-case) would fit the bill, for the venture of getting an aeroplane past the gimletty eyes of the average customs inquisitor. Then I awoke and found that it was after all a case of getting bales of silk from Argentina to Uruguay via the air. What shocks one does get from some of those tabloid headings to be sure.

**S**O often does the Prince of Wales now save time by travelling per aeroplane that before long a new par heading will become necessary, "The Prince's Air Journeys Day by Day." Moreover, when he has passed for his "A" Certificate what a rush there should be to crowd up the ether.

ABOLUS



The Stout Party: "Well, you can do what you like Albert, but you don't catch me 'opping all over the 'eavens in one of them things."

## AIR MINISTRY NOTICES

### NOTICE TO AIRMEN

#### Examination for Air Navigators

1. An examination for 1st and 2nd Class Air Navigators' Licences will be held at the Air Ministry, Gwydyr House, Whitehall, and concurrently for 2nd Class Licences only at the office of the Air Ministry Representative, Heliopolis Aerodrome, Cairo, on Monday, Tuesday and Wednesday, October 14, 15 and 16, 1929.

Candidates for the 1st Class licence will also be required to attend at Croydon Aerodrome on Thursday, October 17, 1929, for a practical examination in meteorology.

Application forms, the syllabi, and conditions of examination may be obtained on application to the Secretary, Air Ministry (C.A.2), Gwydyr House, Whitehall, London, S.W.1, or to the Air Ministry Representative, Cairo-Karachi Service, Heliopolis Aerodrome, Cairo, Egypt.

Formal applications to sit at this examination must be made on form C.A.2c, and together with the prescribed fees must be received at one of the above addresses not later than Monday, October 7, 1929.

(N.B.—Applications to sit in London should be sent to the Air Ministry and applications to sit in Heliopolis should be sent to Cairo.)

Candidates should give with their formal applications full details of any qualifications and experience they already possess.

Before a licence can be issued, candidates will have to pass a medical examination. In the case of candidates sitting in London for the 2nd Class Air Navigator's Licence, arrangements can be made for this examination to take place on Wednesday, October 16, 1929, at the Central Medical Board, 3-4, Clement's Inn, London, W.C.2, if early application is made to be examined on that day. Special arrangements will be made for the medical examination of candidates for the 1st Class Air Navigator's Licence, and for candidates sitting in Cairo for the 2nd Class Licence.

2. All prospective candidates should note that the prescribed fees for the technical 1st and 2nd class examination have not yet been raised to two and five guineas for the 2nd and 1st class licences, respectively. The appropriate fees for the October examination only will therefore remain at 5s. for both 2nd and 1st-class candidates.

3. Amendment:—Paragraph 3 of Notice to Airmen, No. 22, of 1929, is amended by para. 2 of this Notice.

CORRIGENDA.—The following corrections should be made to Notice to Airmen No. 56 of 1929:—

Para. 2, line 2:—"matter" to read "manner."

Para. 5, Sec. 1, line 7:—"their" to read "there".

Para. 5, Sec. 1, line 8:—"discrepancy" to read "discrepancy".

(No. 57 of 1929.)

### NOTICES TO GROUND ENGINEERS

#### Maintenance of Cockpits, etc., in Watertight Condition

The attention of all ground engineers is directed to the importance of maintaining cockpits, windscreens, etc., in watertight condition so as to ensure protection of instruments and other equipment under adverse weather conditions.

Leakage of water through defective joints in cowling and windscreens may seriously impair the efficiency of the aircraft and must be prevented in order to maintain the aircraft in an airworthy condition.

(No. 17 of 1929.)

#### Avro "Avians": Bottom Front Centre Section Spars

(1) The spruce bottom front centre section spar in the fuselage of "Avian" Mark III, IIIA and IV aircraft is liable to split along the line of the bolt holes. This member should be frequently inspected, and, at the first sign of splitting, Modification No. Avian/25, which consists of replacing the existing spruce spar by a birch multi-ply spar of identical cross-sectional dimensions, should be embodied.

(2) No Certificate of Airworthiness will be issued or renewed in respect of "Avian" Mark III, IIIA, or IV aircraft unless the above-mentioned modifications have been satisfactorily incorporated.

(3) The above information is substituted for that contained in Notice to Ground Engineers No. 11 of 1929, which is hereby cancelled.

(No. 18 of 1929.)

#### Doping of Civil Aircraft

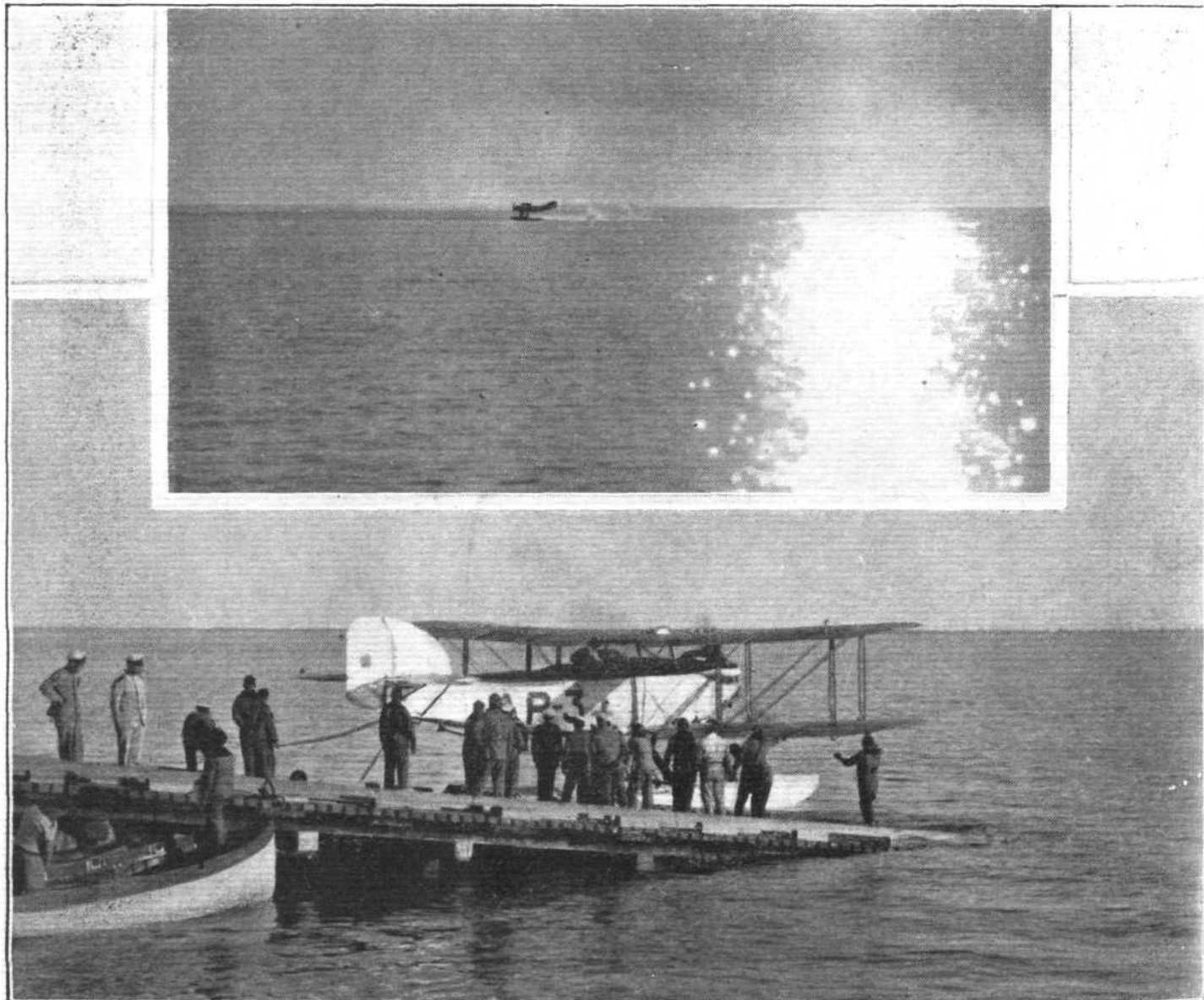
1. The attention of all ground engineers is drawn to the necessity of strict compliance with paragraph 20 (g) of A.N. D. 7, which requires that operations such as doping must be carried out by methods approved by the Secretary of State.

2. The "approved" doping schemes normally require the dope to be applied in an atmosphere absolutely free from draughts and at a minimum temperature of 65° F.

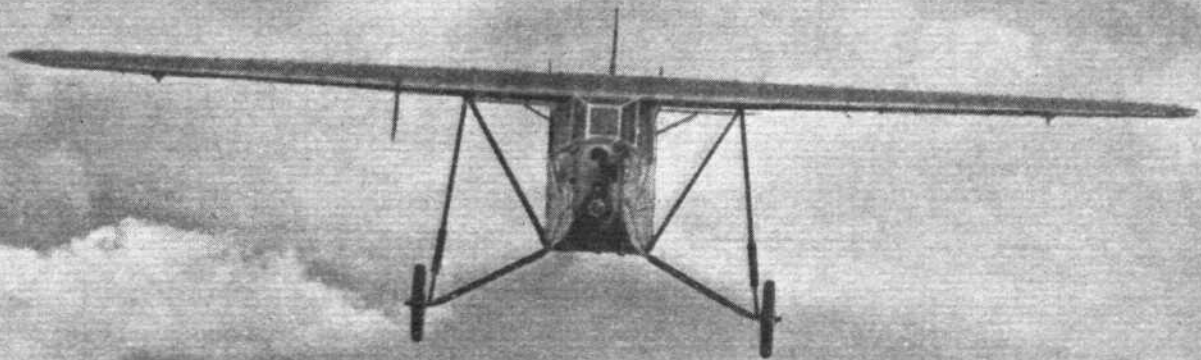
3. When such conditions are not attainable, doping is not permissible unless recourse is had to special "approved" doping schemes which cater for wider ranges of temperature and humidity. The manufacturer concerned issues full instructions as to the manner and conditions of application, and such instructions must be strictly adhered to.

4. All instructions for the application of "approved" doping schemes bear a reference to the approval authority.

(No. 19 of 1929.)

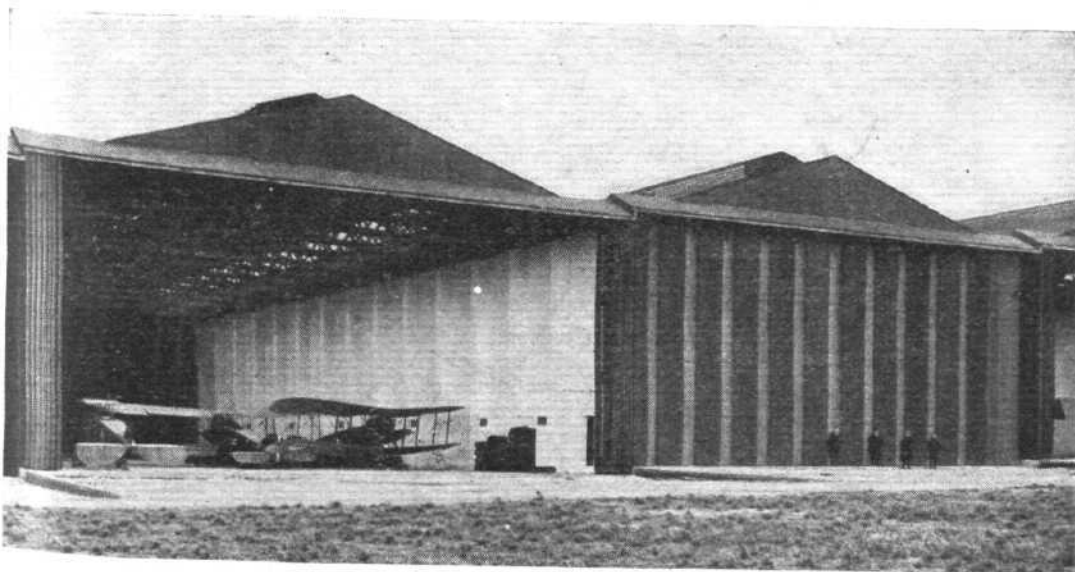


FROM ARGENTINA: It will be remembered that the Fairey Aviation Co., Ltd., built a batch of Fairey III.F. seaplanes for the Argentine Navy a little while back. The above photos, recently received from Argentina, show one of these machines operating from one of the Argentine Navy air bases.



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Esavian Fittings have been supplied to the Government for Doors to cover Ten miles of openings. These openings vary in height up to 32 feet and in length to 100 feet. Esavian Doors were fitted to the Hangar at Calshot which housed the Schneider Cup Aeroplanes, to the Hangar at Heston Aerodrome, 19 feet in height and 100 feet in length, and are also being supplied to Hanworth Park.

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I beg to enclose two photos of an  
Austin Seven Saloon which turned over whilst  
travelling at about 60 m.p.h. in the New  
Forest on Sunday last. I understand that the  
driver was the only occupant and that he was  
taken to Romsey Cottage Hospital suffering from  
injuries to his arm.  
As you will see, the body work is  
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windscreen is no more than starred and cracked,  
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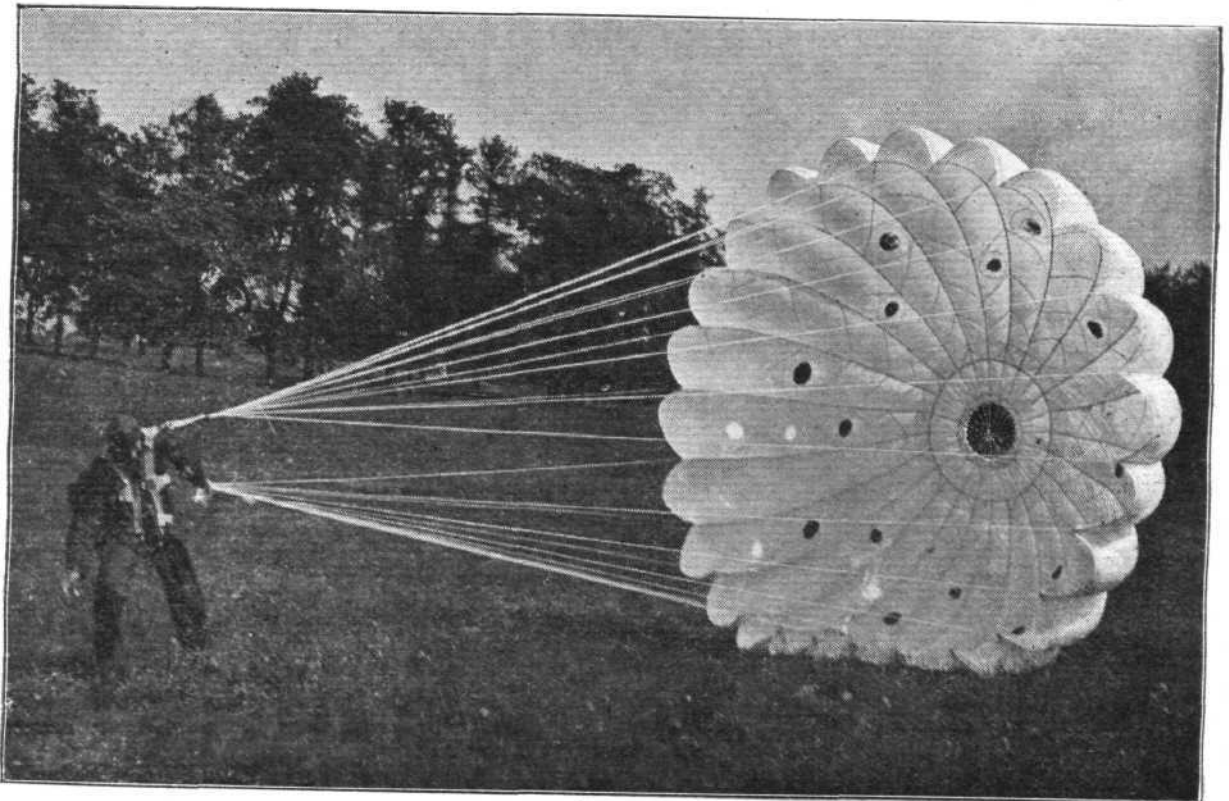
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# THE ROYAL AIR FORCE

London Gazette, September 17.

## General Duties Branch

The follg. are granted permanent commissions as Pilot Officers, with effect from September 7, and with seniority of September 7, 1928:—F. J. St. G. Braithwaite, H. P. Fraser, R. Harston, G. J. C. Paul.

R. C. Noble is granted a short-service commission as a Pilot Officer on probation, with effect from September 9 and with seniority of August 30.

The follg. are granted temporary commissions as Flying Officers on attachment for duty with the R.A.F. (September 8):—

Lieuts., R. N.—T. G. Carey, K. Williamson.  
Sub-Lieuts., R.N.—A. G. Tillard, C. D'O. Umfreville, D. A. H. Hornell.  
Mate, R.N.—H. H. Gardner.  
Lieut., R.M.—G. K. Martyn.

The follg. Pilot Officers on probation are confirmed in rank:—  
J. A. Easton (August 7); J. E. Beynon, C. C. C. Manson, C. Ray (September 14).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

### General Duties Branch

*Wing Commander* J. K. Wells, A.F.C., to No. 15 Sqn., Martlesham Heath. To command, 2.9.29.

*Squadron-Leaders*: C. E. H. James, M.C., to H.Q., Inland Area, Stanmore, 2.9.29. G. W. Bentley, D.F.C., to R.A.F. Depot, Uxbridge, 23.9.29. E. F. Turner, A.F.C., to H.Q., Coastal Area, 9.9.29.

*Flight Lieutenants*: N. W. F. Mason, to No. 504 Sqn., Nottingham, 16.9.29. J. H. Butler, to No. 3 Flying Training Schl., Grantham, 9.9.29. A. King-Lewis, to Armament and Gunnery Schl., Eastchurch, 4.9.29.

*Flying Officers*: W. J. Coadwell, D.S.M., to Electrical and Wireless Schl., Cranwell, 13.9.29. J. H. Edwards Jones, to No. 1 Flying Training Schl., Netheravon, 10.9.29. R. S. Darbishire, to R.A.F. Depot, Uxbridge, 1.9.29. T. L. Harrison, to No. 504 Sqn., Nottingham, 10.9.29.

*Pilot Officers*: C. W. Black, to No. 2 Flying Training School, Digby, 9.9.29. F. J. St. G. Braithwaite, H. P. Fraser, R. Harston, G. J. C. Paul, all to No. 1 Flying Training Schl., Netheravon. On appointment to Permanent Comms. with effect from 7.9.29.

The follg. Pilot Officers are promoted to the rank of Flying Officer:—E. R. White (July 9); O. I. Gilson (September 16).

Sqdn.-Ldr. H. E. M. Watkins, A.F.C., R.D., is placed on the retired list, and is granted permission to retain the rank of Wing Commander (September 15).

The follg. are transferred to the Reserve:—

CLASS A.—Flight-Lieut. J. J. Nolan, Flying Officer W. F. Rimmer, Flying Officer C. W. Switzer (September 15); Flying Officer F. T. Stacey (September 18).

CLASS C.—Flying Officer J. A. C. Florence, Flying Officer L. R. Mizen, Flying Officer R. J. Stevens (September 15).

Flying Officer G. B. Collet relinquishes his short service commission on account of ill-health (September 15).

The short service commissions of the follg. Pilot Officers on probation are terminated on cessation of duty:—F. R. Bevan, G. R. O'C. Lempiere (September 13); K. R. Garle (September 17).

Flying Officer P. N. R. Hallward (Lieut., The Border Regt.) relinquishes his temporary commission on return to Army duty (September 12).

R. C. Noble, to R.A.F. Depot, Uxbridge. On appointment to a short service comm., on probation, 9.9.29.

The undermentioned Pilot Officers are posted to No. 1 Flying Training Schl., Netheravon, with effect from 8.9.29:—R. B. Abraham, M. J. Adam, J. C. Atkins, A. C. Bailey, J. L. C. Banks, D. Barclay, D. Carr, R. J. Cowen, N. Kirkham, A. N. Luxmoore, J. E. C. McClure, R. M. Noblston, A. W. B. Page, M. E. Pickford, W. J. Scott, W. B. J. Sharp, G. E. B. Stoney, G. R. Stroud, L. Watson, R. L. West, A. M. Wood, E. Poole.

### Accountant Branch

*Squadron-Leader* P. A. Simmons, to H.Q., Fighting Area, Uxbridge, 3.9.29.

### Medical Branch

*Flight Lieutenants* E. J. Jenkins, to Palestine General Hospital, 27.8.29. J. E. Foran, M.B., to R.A.F. Depot, Uxbridge, 22.8.29. G. P. O'Connell, M.B., to No. 28 Sqn., India, 16.8.29, instead of to H.Q., R.A.F., India, as previously notified.

### Erratum

With reference to General Duties Branch of R.A.F. Intelligence, dated 13.8.29, No. 1018:—

For Flying Officer N. B. Morris read Flying Officer N. B. Norris.

## THE MODEL AIRCRAFT CLUB

A VERY successful meeting was held by the Model Aircraft Club on Sunday afternoon at Epsom. The middle of the race course formed an ideal flying ground and, though the wind was somewhat high at times some excellent flights were made.

A large and enthusiastic crowd had gathered by 2 p.m., and there must have been over 300 people with some 120 cars present. The keenness of the members was an example that could well be copied by many people connected with full scale aircraft industry and their efforts gained much applause from the spectators who were equally keen.

There must have been between two and three dozen machines of all types, monoplanes, biplanes, fuselage and spar machines and two power driven machines, one compressed air and one petrol. The compressed air machine made several long flights after a runway had been prepared for it to leave the ground, by enlisting the help of many small boys to tear up the worst of the grass tufts.

The petrol-driven machine had bad luck. It has a four-bladed airscrew and at the beginning of the meeting one of the blades got broken when taxiing. An attempt was made to get it in the air by removing the opposite blade but the loss of flywheel effect prevented the little single cylinder motor from functioning satisfactorily and we were unable to see it flying.

Several extremely long flights were made by the rubber-driven machines, particularly the smaller ones; the gusty wind seemed against the larger machines and much excitement was caused when they sometimes got blown backwards and turned and dived at the crowd. To one not well up in the sport it was particularly astonishing to see what an enormous amount of knocking about such models will stand. On some occasions the machines would dive full speed into the ground—a real full speed too!—but the owner would just pick them up (if an enthusiastic small boy had not already done so) straighten out the airscrew boss, replace the wing, and have another shot.

Another point which seemed as if its study might conceivably benefit our full scale designers was the prevalence of tail flutter, and in the case of machines with an exaggerated aspect ratio, wing flutter. The stability of the larger machines was very marked—as they almost always made perfect three-point landings.

The club is to be congratulated on their fine effort. To gather such a large and enthusiastic crowd for their first meeting is no small achievement, and as one is told that the membership list is still growing the future seems well assured; which is to be desired as there is no doubt that their activities will foster air-mindedness in the younger generation and so ultimately benefit the whole industry.

## THE R.A.F. SWIMMING CHAMPIONSHIPS

THE R.A.F. Swimming Championships were held at the St. George's Baths on Friday, September 13. Although held at the awkward hour of 7.45 p.m. there were, nevertheless, a fair number of spectators present, and the partisans of various depots voiced their partisanship in no uncertain manner.

*Event 1 (which was swum in the morning).*—440 yards. 1st, AC. Reeves; 2nd, Sgt. McGinn. Time, 7 mins. 5 secs. Record, 6 mins. 42 secs.

*Event 2.*—100 yards *Back-Stroke*. 1st, Pilot Officer Bearne; 2nd, AC. Greenwood. Time, 1 min. 23 4/5 secs. New record.

*Event 3.—An Invitation Relay Race.* 1st, Penguin Swimming Club; 2nd, Croydon Swimming Club. Time (two lengths), 2 mins. 17 1/5 secs.

*Event 4.*—220 yards. 1st, L./AC. Henderson; 2nd, AC./A. Godwin. Time, 2 mins. 57 1/5 secs. New record.

*Event 5.*—Heats for the Inter-Unit Relay Race.

*Event 6.*—100 yards *Breast Stroke*. 1st, AC./A. Bradshaw; 2nd, L./AC. Nicholls. Time, 1 min. 24 4/5 secs. Record, 1 min. 24 2/5 secs.

*Event 7.—Diving.* 1st, AC./A. Feak, 78 pts.; 2nd, AC. Richards, 75 pts.

*Event 8.—Plunging.* 1st, Flight-Lieut. Smylie, 60 ft. 5 1/2 ins.; 2nd, Wing Commr. Mounsey, 58 ft. 7 1/2 ins. New record.

*Event 9.*—100 yards. 1st, AC. Robertson; 2nd, AC. Brown. Time, 64 1/5 secs. New record.

*Event 10.—Inter-Unit Relay Race.* 1st, Henlow; 2nd, Digby; 3rd, Manston. Distance (for the first time), 240 yards. Time, 2 mins. 35 1/5 secs.

*Event 11.*—An exhibition of swimming by the Misses E. Fredrick E. Hazell and M. Svendsen, of the Hammersmith Ladies' Swimming Club. A very original and clever exhibition.

*Event 12.—Final Inter-Unit Water Polo Championship.* After an extra 3 mins. each way the game had to be left to a draw, to be replayed later.

Final score: Digby 4 goals and Manston 4 goals.

## R.A.E.S. AND INST.AE.E.

THE following lectures have been arranged for the first half of the Sixty-fifth Session of the Royal Aeronautical Society:—

Oct. 10. Mr. C. R. Fairey, M.B.E., F.R.Ae.S. "The Range of Aircraft."

" 24. Capt. N. Macmillan, M.C., A.F.C., A.F.R.Ae.S., A.M.I.Ae.E. "The Art of Flying Land and Sea Machines."

Nov. 7. Dr. A. E. Dunstan. "Recent Developments of Fuels and Dopes for Aircraft Engines."

" 21. Mr. L. W. Johnson. "The Inspection of Materials."

" 28. Squadron Leader H. M. Probyn, D.S.O. "Flying and Maintenance from the Owner's Point of View."

Dec. 5. Senr. J. de la Cierva. "Recent Work on the Autogiro."

" 12. Dr. W. Rosenhain, D.Sc., F.R.S. "The Development of Materials for Aircraft Purposes."

The lectures in all cases will be delivered in the Lecture Hall of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2. They will begin at 6.30 p.m. with the exception of the lecture on November 21, which will begin at 7.45 p.m. and be a joint meeting with the Institution of Automobile Engineers.

J. LAURENCE PRITCHARD, Secretary.

## Royal Air Force Memorial Fund

THE usual meeting of the Grant Sub-Committee was held on September 5. Mr. W. S. Field was in the Chair, and the other member of the committee present was:—Squadron Leader A. H. Wann.

The committee considered in all 13 cases, and made grants to the amount of £58 17s.

The next meeting was fixed for September 19, at 2.30 p.m.

## CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

### SCHNEIDER TROPHY MACHINES

[2209] One hears that the experts have expressed themselves as disappointed at the World's Speed Record set up by the Supermarine Rolls-Royce S.6, but it must have become clear by now that one cannot expect a Schneider Trophy machine to hold the world's record for speed very long in these days of intensive competition. It will have to be re-designed for the shorter distance with smaller tankage, less weight, consequently smaller floats, all of which will help to increase the speed. Then again there is no necessity for it to be a really seaworthy machine, as long as it is possible to get it off the water and to re-align again.

Consequently in the future one may expect to see the world's speed record holder as quite a different machine to the contemporary Schneider Trophy winner.

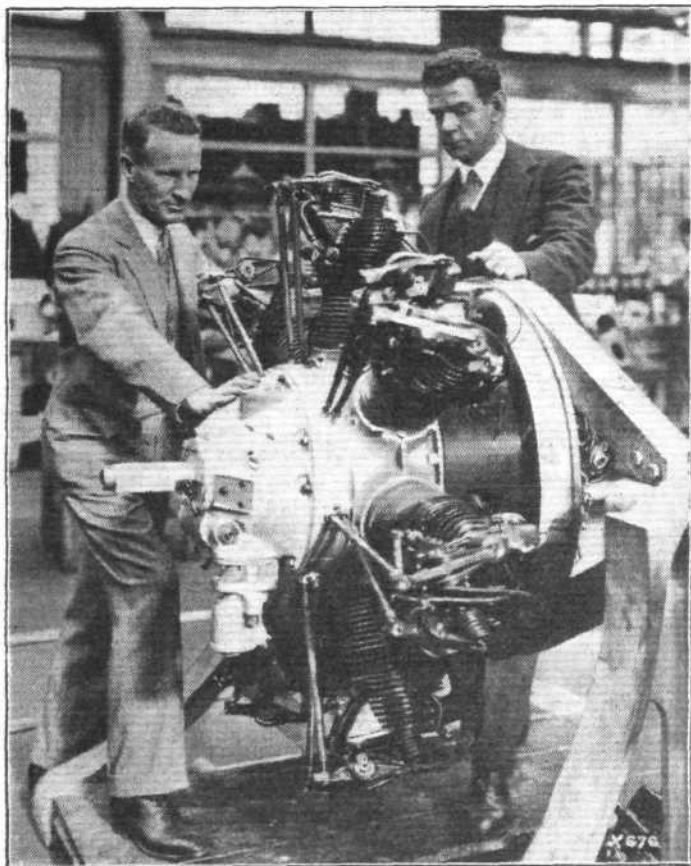
It has also been stated for the last two contests that no appreciable improvement can be made in the aerodynamic efficiency of the machines and that it now becomes a question of cramming more power into the same space. This may be so, in which case one would expect the Savoia type of machine with two engines to come to the front.

There does, however, appear to be a possibility of making even yet an improvement in the aerodynamic properties of the S.6—an improvement which one feels sure has not escaped the notice of either Mr. Mitchell or Mr. Folland, but at present no suitable engine presents itself.

This improvement is—to have the V-engine inverted and to mould both the wing roots and the upper ends of the float struts into the cylinder blocks, in much the same way as the Gloster-Napier IV biplane had its upper wing roots moulded into the cylinder blocks in 1927.

T. W. E. BROGDEN

Dungannon, Co. Tyrone.  
September 16, 1929.



THE TRANS-PACIFIC FLYERS AT COVENTRY: Sqdn.-Ldr. C. E. Kingsford Smith (left) and Flight-Lieut. C. T. P. Ulm recently delivered a lecture on their trans-Pacific flight before the Coventry branch of the Royal Aeronautical Society at the Armstrong Siddeley works, where they are seen above inspecting a "Lynx."

## PERSONALS

### Married

On September 23, 1929, in London, CAPTAIN PHILIP BATEMAN, late London Irish and R.A.F., only son of Mrs. H. Bateman, 26, Cadogan Gardens, and MAISIE, elder daughter of Mr. M. JOAKIM, of Grosvenor House, and Rangoon, Burma.

On September 7, at Our Lady of Victories Church, Kensington, FLIGHT-LIEUTENANT PERCY JACK CLAYSON, M.C., D.F.C. (retired), son of the late Mr. and Mrs. John H. Clayton, of Beccles, to KATHLEEN, daughter of Mr. and Mrs. WILLIAM THORNTON, of Kelvingrove, Glasgow.

### To be Married

A marriage is arranged, and will take place in October, between ANDREW JAMES WRAY GEDDES, R.A. and R.A.F., only son of the late Major M. H. B. Geddes, Indian Army, and Mrs. Geddes, Seaford, Sussex, and ANSTICE WYNTER, elder daughter of the Rev. A. W. and Mrs. LEACH, Leasingham Rectory, Seaford.

The engagement is announced between FLIGHT-LIEUTENANT EUSTACE JACK LINTON HOPE, A.F.C., R.A.F., son of the late Maj. Linton Hope and Mrs. Hope, of Kingshotts, Fernhurst, Sussex, and EVELYN HOPE, second daughter of Sir ARTHUR and Lady BALFOUR, of Ropes, Fernhurst, Sussex, and Riverdale Grange, Sheffield.

The engagement is announced between FLYING-OFFICER DUNCAN GARDENER MCDIARMID, R.A.F., Altrincham, Cheshire, son of Mr. John McDiarmid, Stirling, and DULCIA KATHLEEN, second daughter of the late NORMAN GARDENER, Ash, Kent, and granddaughter of the late William Gardener, of Little Howlett, Littlebourne.

The engagement is announced of FLYING OFFICER D. B. MCGILL, son of Mr. J. McGill, de Burgh Street, Cardiff, and Miss MARJORIE CLEMENTS, second daughter of Mr. and Mrs. H. Clements, Northumberland Street, Cardiff.

The marriage arranged between FLIGHT-LIEUT. D. R. W. THOMPSON and AILEEN, daughter, of Mrs. SEYMOUR HILL, Park House, Southwell, and the late Rev. J. Seymour Hill, will take place quietly at 2.15, in St. Mark's Church, North Audley Street, London, on October 3. Will any friends take this as a cordial invitation to the church.

### Births

On September 15, 1929, at a nursing home, Alverstoke, to DOROTHY, wife of FLIGHT-LIEUT. BERNARD L. BLOFIELD, R.A.F., Lee-on-Solent—a daughter.

On September 17, 1929, at 7, Airlie Gardens, W.8, to MARY (née Olivier), wife of SQDN.-LDR A. P. MARTYN SANDERS—a daughter.

### Death

On September 15, 1929, at Butterstone, Perthshire, GWENDOLEN, dearly-loved wife of SQDN.-LDR W. H. DE WARRENNE WALLER, R.A.F., youngest daughter of the late J. H. Lambert, of Redmount, Co. Galway.

## PUBLICATIONS RECEIVED

*Flying Pioneers at Hammondsport, N.Y.* A brief outline of the History of "The Cradle of Aviation," and of the Work of Invention, Development and Demonstration done there by Glenn H. Curtiss, Alexander Graham Bell, etc. Written for the Finger Lakes Association and the Better Hammondsport Club, by Lyman J. Seely. The Fenton Press, Auburn, N.Y.

*Air Defence.* By Maj.-Gen. E. B. Ashmore. Longmans, Green & Co., 39, Paternoster Row, London, E.C. Price 8s. 6d. net.

*Aeronautical Research Committee Reports and Memoranda: No. 1211 (E.20).—The Effective Torsional Rigidity of a Crank.* By R. V. Southwell, F.R.S. July 1927. Price 9d. net. H.M. Stationery Office, Kingsway, London, W.C.2.

*The Journal of the Royal Air Force College.* (Cranwell.) Vol. IX, No. 2, Autumn, 1929. Gale and Polden, Ltd., London, Aldershot and Portsmouth.

### Catalogues

*Gear Wheels, Pinions and Gear Cases. Crane and Mine Insulators and Fittings.* Alfred Wiseman, Ltd., Glover St., Birmingham.

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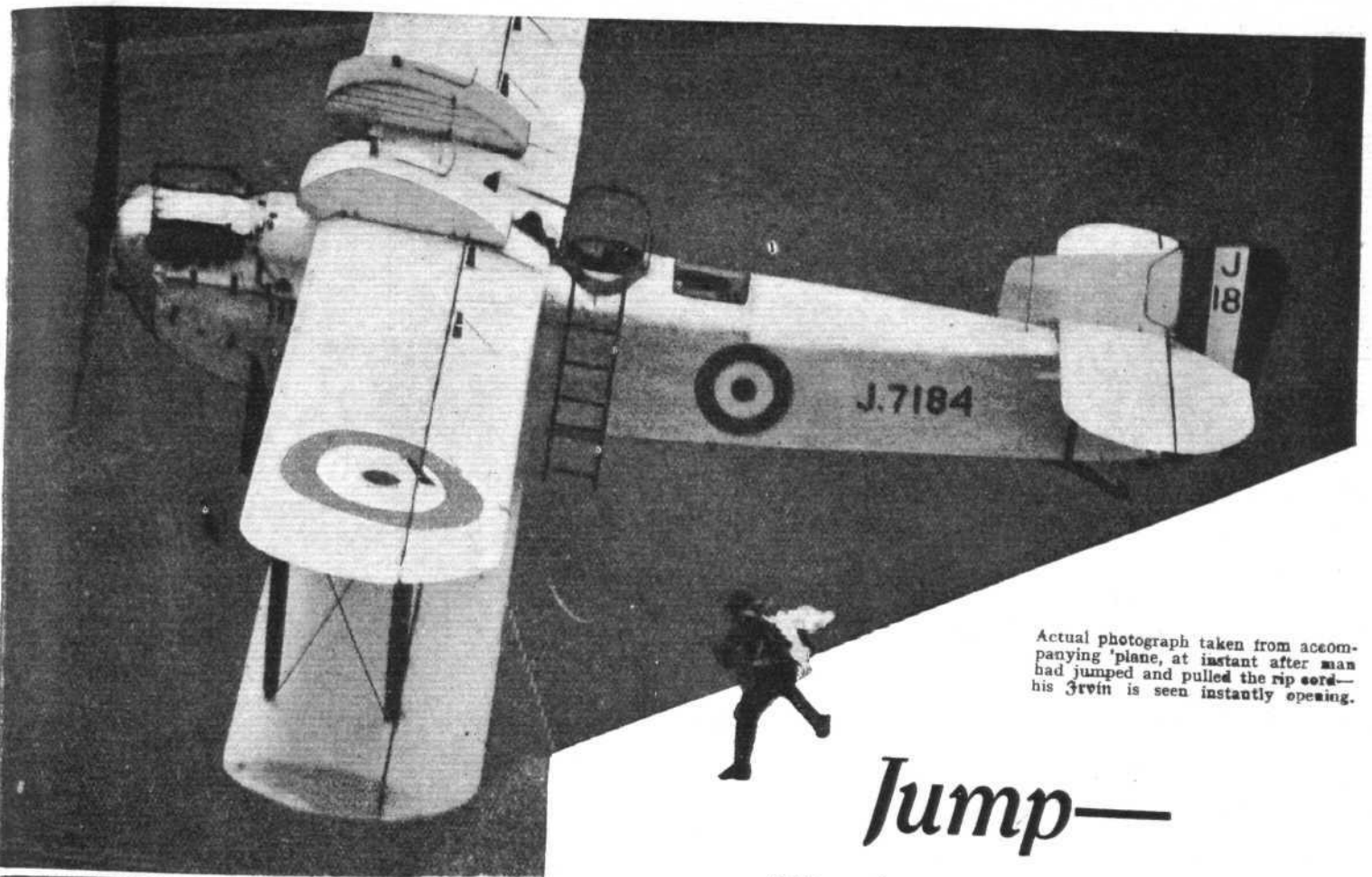
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